REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS U.S., LLC.
IN QUEENSBURY, NEW YORK
ON OCTOBER 24, 2017

Submitted to:

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION
P.O. Box 220
232 Hudson Street
Warrensburg, New York 12885-0220

Submitted by:

STERIGENICS US, LLC.
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Queensbury, New York 12804

NYDEC Permit Number 5-5344-00029/00011

Prepared by:

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December 21, 2017

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1.0 INTRODUCTION

On Monday, October 23, 2017, ECSi performed air pollution source testing of an ethylene oxide (EtO) emission-control system operated by Sterigenics U.S., LLC. in Queensbury, New York. The control device tested is a Donaldson EtO Abator catalytic oxidizer, which is currently used to control emissions from ten EtO sterilizer backvents and five aeration rooms/cells. The purpose of the testing program was to evaluate compliance with EPA requirements under the current National Emissions Standards for Hazardous Air Pollutants (NESHAP), and with the conditions established in the permit (Number 5-5344-00029/00011) granted to Sterigenics US, LLC. by the New York Department of Environmental Conservation (NYDEC).

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of eleven commercial sterilizers, all discharging through liquid-ring vacuum pumps to a packed-tower acid scrubber emission control device. In compliance with NYDEC and USEPA requirements, and all aeration room vents are discharged to a Donaldson EtO Abator catalytic oxidizer emission control device. In compliance with NYDEC requirements, all chamber exhaust vents ("backvents") are discharged to the same Donaldson EtO Abator catalytic oxidizer emission control device. The gas-sterilization and emission-control equipment consists of the following:

- Eleven Gas Sterilizers, one 26-pallet chamber (3003 cubic feet), four 13-pallet (1333 cubic feet), four 8-pallet (two: 1155 cubic feet; two: 1200 cubic feet), and two 3-pallet (350 cubic feet) capacity, each comprised of a steam-heated sterilization chamber, a recirculating vacuum pump chamber evacuation system, a chamber backvent valve, and a fugitive emissions exhaust hood;

- Five Aeration Rooms, three 48-pallet (11,340 cubic feet), one 685-pallet (189,642 cubic feet), and one 3764 cubic feet capacity, each comprised of a heated aeration room and an aeration room exhaust system.

Sterilizer vacuum pump emissions are controlled by:

- One Ceilcote packed tower acid scrubber, Model SPT-42-120, equipped with a bed of No. 1 Tellerette packing, a 5000 gallon reaction tank/reservoir, a scrubber fluid recirculation pump, and an exhaust blower.

Sterilizer backvent and aeration emissions are controlled by:

- One Donaldson EtO Abator System, operated at approximately 6,000 SCFM, equipped with a prefilter, a steam heater, an exhaust gas heat exchanger, a reactive catalyst bed, and an exhaust blower.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring for each test run was conducted simultaneously at the inlet and outlet of the catalytic oxidizer during chamber backvent, and during a one-hour interval of the 24-hour aeration process. A total of three chamber backvent test runs, and three one-hour aeration test runs, were performed.

During backvent and aeration testing, EtO emissions at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics U.S., LLC. was tested to determine compliance with the current federal EPA National Emissions Standard for Hazardous Air Pollutants (NESHAP) for ethylene oxide, and with the requirements specified in the NYDEC Permit. The current testing was performed to demonstrate continued compliance with the following requirements:

- The emissions from the sterilization chamber exhaust vents (backvents) must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight.

- The emissions from the aeration process must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight, or which reduces the EtO concentration at the emission-control outlet to less than 1 ppm.

Testing is required to demonstrate compliance with these requirements. Source testing of the emission-control device is conducted annually.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

The testing procedures outlined herein are based on USEPA source-sampling methods. EtO control efficiency and mass-emissions testing were conducted by USEPA CFR40, Part 63.365, and in accordance with NYDEC requirements. EtO emissions monitoring for each test run was conducted simultaneously at the inlet and outlet of the catalytic oxidizer during chamber backvent, and during a one-hour interval of the 24-hour aeration process. A total of three chamber backvent test runs, and three one-hour aeration test runs, were performed.

During backvent and aeration testing, EtO emissions at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product.

Operation and documentation of process conditions were performed by personnel from Sterigenics using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In accordance with the procedures established in USEPA CFR40, Part 63, Subpart O, the following parameter was recorded: catalyst bed operating temperature. Process condition data is noted in Tables 1 and 2.

5.2 VOLUMETRIC FLOW MEASUREMENT

Exhaust gas flow at the outlet of the catalytic oxidizer was determined by EPA Method 2C using a standard pitot tube and an inclined-oil manometer. Sampling ports were installed in accordance with EPA Method 1, and were located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible, at about 3 percent.

5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT

During backvent and aeration testing, EtO emissions at the inlet and outlet of the catalytic oxidizer were determined using direct source sample injection into the GC. The mass of EtO emitted to the inlet and from the outlet was determined using the equation shown below in Section 5.9. Mass-mass control-efficiency of EtO during the backvent and aeration phases was calculated by comparing the mass of EtO vented to the system inlet to the mass of EtO vented from the system outlet.

During the backvent and aeration phases, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify inlet EtO emissions, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the emission-control device outlet.

5.4 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet, the sampling port was located in the common backvent/aeration discharge duct, upstream of the oxidizer. At the outlet of the catalytic oxidizer, sampling ports were located in the exhaust stack downstream of the catalyst bed.

5.5 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately five minute intervals during the aeration-phase testing. Helium was the carrier gas for both the FID and PID.

5.6 GC CONDITIONS

The packed columns for the GC were both operated at 80 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were helium (99.999% pure), hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

5.7 CALIBRATION STANDARDS

The FID was calibrated for mid-range part-per-million-by-volume (ppmv) level analysis using gas proportions similar to the following:

1) 1,000 ppmv EtO, balance nitrogen
2) 100 ppmv EtO, balance nitrogen
3) 50 ppmv EtO, balance nitrogen (audit gas)
4) 10 ppmv EtO, balance nitrogen
5) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix I.

5.8 SAMPLING DURATION

Backvent testing was performed in conjunction with normal production operations, during the chamber exhaust venting which is conducted for each sterilization chamber upon conclusion of the sterilization cycle, immediately prior to and during chamber unloading. Backvent sampling duration was 15 minutes for each of the three test runs.

Since aeration is a 24-hour process at this facility, with constant discharge flow from the aeration chambers to the emission-control system, aeration testing consisted of three 1-hour test runs. Each test run was performed with freshly sterilized product in the aeration chambers.

5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS

Mass emissions of EtO during aeration were calculated using the following equation:

$$MassRate = (VolFlow)(MolWt)(ppmv\ EtO/10^6)/(MolVol)$$

Where:

MassRate	=	EtO mass flow rate, pounds per minute
VolFlow	=	Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F
MolWt	=	44.05 pounds EtO per pound mole
ppmv EtO	=	EtO concentration, parts per million by volume
10^6	=	Conversion factor, ppmv per "cubic foot per cubic foot"
MolVol	=	385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Mass-mass control efficiency of EtO was calculated for aeration. Results of the control-efficiency testing are presented in Tables 1 and 2.

6.0 TEST SCENARIO

The backvent and aeration testing was performed during normal process load conditions. Three backvent and three aeration test runs were conducted in series to verify the performance of the emission-control device. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) Aeration Phase Test Run #1 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
3) Backvent Phase Test Run #1 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
4) Backvent Phase Test Run #2 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
5) Aeration Phase Test Run #2 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
6) Backvent Phase Test Run #3 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
7) Aeration Phase Test Run #3 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
8) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix I.

8.0 TEST RESULTS

The catalytic oxidizer was found to have an average EtO control efficiency of 99.92 percent for backvent, and an average EtO control efficiency of 99.86 percent for aeration. During the testing the catalytic oxidizer was operated at 291 degrees during both backvent and aeration. In accordance with state and federal requirements, backvent and aeration discharge streams must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 percent by weight. The catalytic oxidizer met this requirement.

The test results are summarized in Tables 1 and 2. These tables include results for EtO control efficiency and mass emissions of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through G. Copies of field data and calculation worksheets are attached as Appendix H.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS U.S., LLC.
IN QUEENSBURY, NEW YORK
ON OCTOBER 24, 2017

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	847	5.25	0.01	99.8095
1	852	5.55	0.01	99.8198
1	857	5.30	0.01	99.8113
1	902	5.05	0.01	99.8020
1	907	5.11	0.01	99.8043
1	912	5.22	0.01	99.8084
1	917	4.94	0.01	99.7976
1	922	4.84	0.01	99.7934
1	927	5.35	0.01	99.8131
1	932	5.74	0.01	99.8258
1	937	5.29	0.01	99.8110
1	942	5.05	0.01	99.8020
2(4)	1027	6.32	0.01	99.8418
2	1032	6.28	0.01	99.8408
2	1037	6.76	0.01	99.8521
2	1042	6.66	0.01	99.8498
2	1047	7.36	0.01	99.8641
2	1052	7.60	0.01	99.8684
2	1057	7.92	0.01	99.8737
2	1102	8.99	0.01	99.8888
2	1107	8.00	0.01	99.8750
2	1112	8.30	0.01	99.8795
2	1117	8.02	0.01	99.8753
2	1122	7.92	0.01	99.8737
3(5)	1149	9.21	0.01	99.8914
3	1154	9.13	0.01	99.8905
3	1159	9.17	0.01	99.8909
3	1204	9.14	0.01	99.8906
3	1209	9.38	0.01	99.8934
3	1214	9.30	0.01	99.8925
3	1219	9.18	0.01	99.8911
3	1224	9.40	0.01	99.8936
3	1229	9.31	0.01	99.8926
3	1234	9.29	0.01	99.8924
3	1239	9.34	0.01	99.8929
3	1244	9.06	0.01	99.8896
TIME-WEIGHTED AVERAGE:		**7.326**	**0.0100**	**99.8551**
		NYDEQ REQUIRED CONTROL EFFICIENCY:		**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 08:45, ended at 09:45.
(4) - Aeration Phase Test Run #2 started at 10:25, ended at 11:25.
(5) - Aeration Phase Test Run #3 started at 11:47, ended at 12:47.
(6) - During aeration testing, the average recorded catalyst bed temperature was 291 deg F

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TABLE 2
ETHYLENE OXIDE CONTROL EFFICIENCY - BACKVENT
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS U.S., LLC.
IN QUEENSBURY, NEW YORK
ON OCTOBER 24, 2017

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1010	217	0.01	99.9954
1	1011	78.9	0.01	99.9873
1	1012	51.5	0.01	99.9806
1	1013	46.8	0.01	99.9786
1	1014	43.6	0.01	99.9771
1	1015	41.3	0.01	99.9758
1	1017	39.8	0.01	99.9749
1	1018	37.9	0.01	99.9736
1	1019	36.9	0.01	99.9729
1	1020	35.4	0.01	99.9718
1	1022	30.1	0.01	99.9668
1	1023	19.9	0.01	99.9497
2(4)	1132	9.48	0.01	99.8945
2	1133	10.3	0.01	99.9029
2	1134	9.06	0.01	99.8896
2	1136	8.93	0.01	99.8880
2	1137	9.00	0.01	99.8889
2	1138	8.91	0.01	99.8878
2	1139	8.99	0.01	99.8888
2	1140	9.12	0.01	99.8904
2	1141	9.20	0.01	99.8913
2	1142	9.28	0.01	99.8922
2	1144	9.19	0.01	99.8912
2	1145	9.21	0.01	99.8914
3(5)	1251	8.11	0.01	99.8767
3	1252	18.5	0.01	99.9459
3	1253	10.0	0.01	99.9000
3	1254	9.57	0.01	99.8955
3	1255	8.98	0.01	99.8886
3	1256	9.13	0.01	99.8905
3	1258	9.05	0.01	99.8895
3	1259	9.03	0.01	99.8893
3	1300	9.18	0.01	99.8911
3	1302	8.80	0.01	99.8864
3	1303	8.52	0.01	99.8826
3	1304	8.52	0.01	99.8826
TIME-WEIGHTED AVERAGE:		**25.20**	**0.0100**	**99.9200**
			NYDEQ REQUIRED CONTROL EFFICIENCY:	**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Backvent Phase Test Run #1 started at 10:09, ended at 10:24.
(4) - Backvent Phase Test Run #2 started at 09:53, ended at 10:08.
(5) - Backvent Phase Test Run #3 started at 12:50, ended at 13:05.
(6) - During backvent testing, the average recorded catalyst bed temperature was 291 deg F

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APPENDICES

APPENDIX A

Calibration Data

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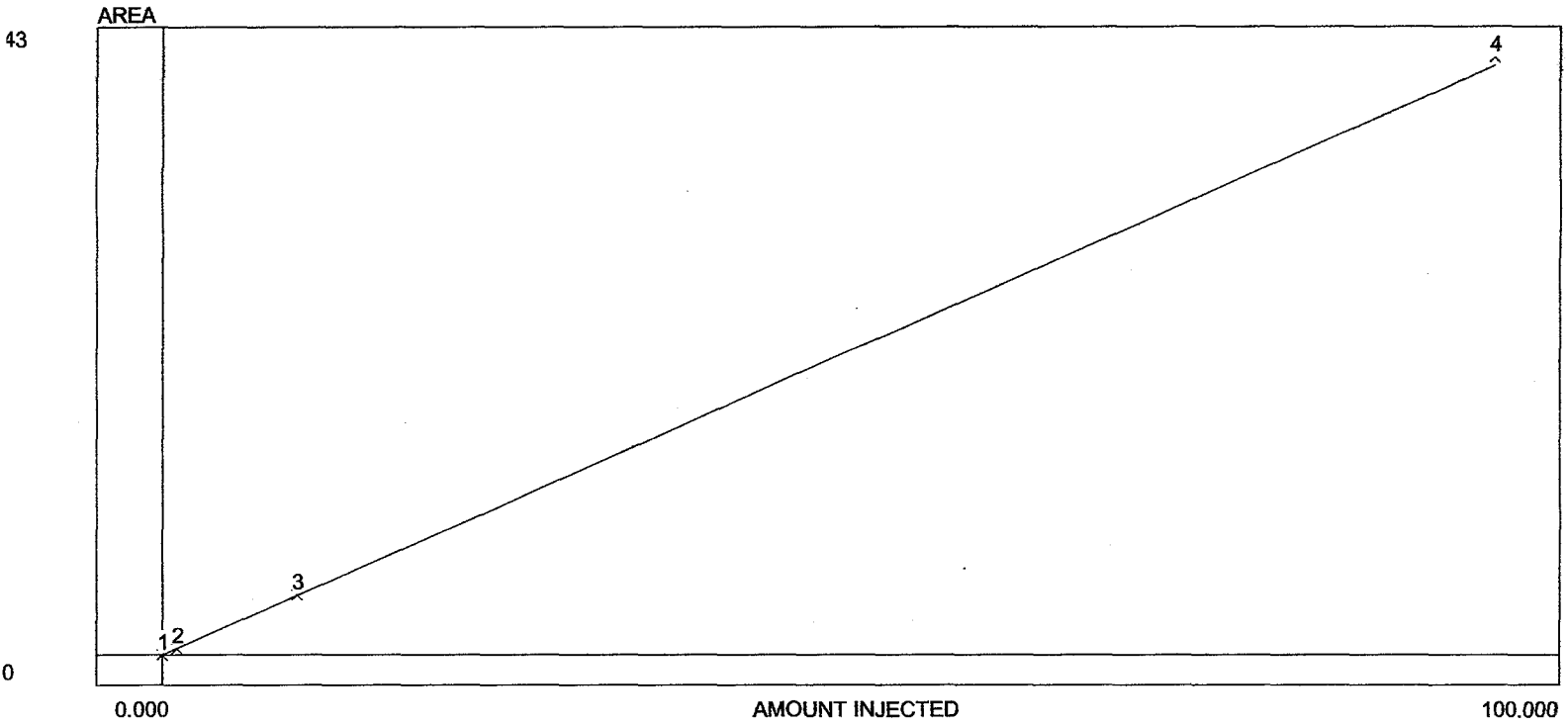
Component file: 359-700.cpt

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.300		0.000	
2	Ambient H2O	0.300	0.430		0.000	
3	Ethylene Oxide	0.430	0.550	C:\peak359\1Ster	0.0007.cp	ppm
4	Acetaldehyde	0.550	0.800		0.000	
5	CO2	0.800	1.000		0.000	

Calibration file: C:\peak359\1SterQ2017.cal



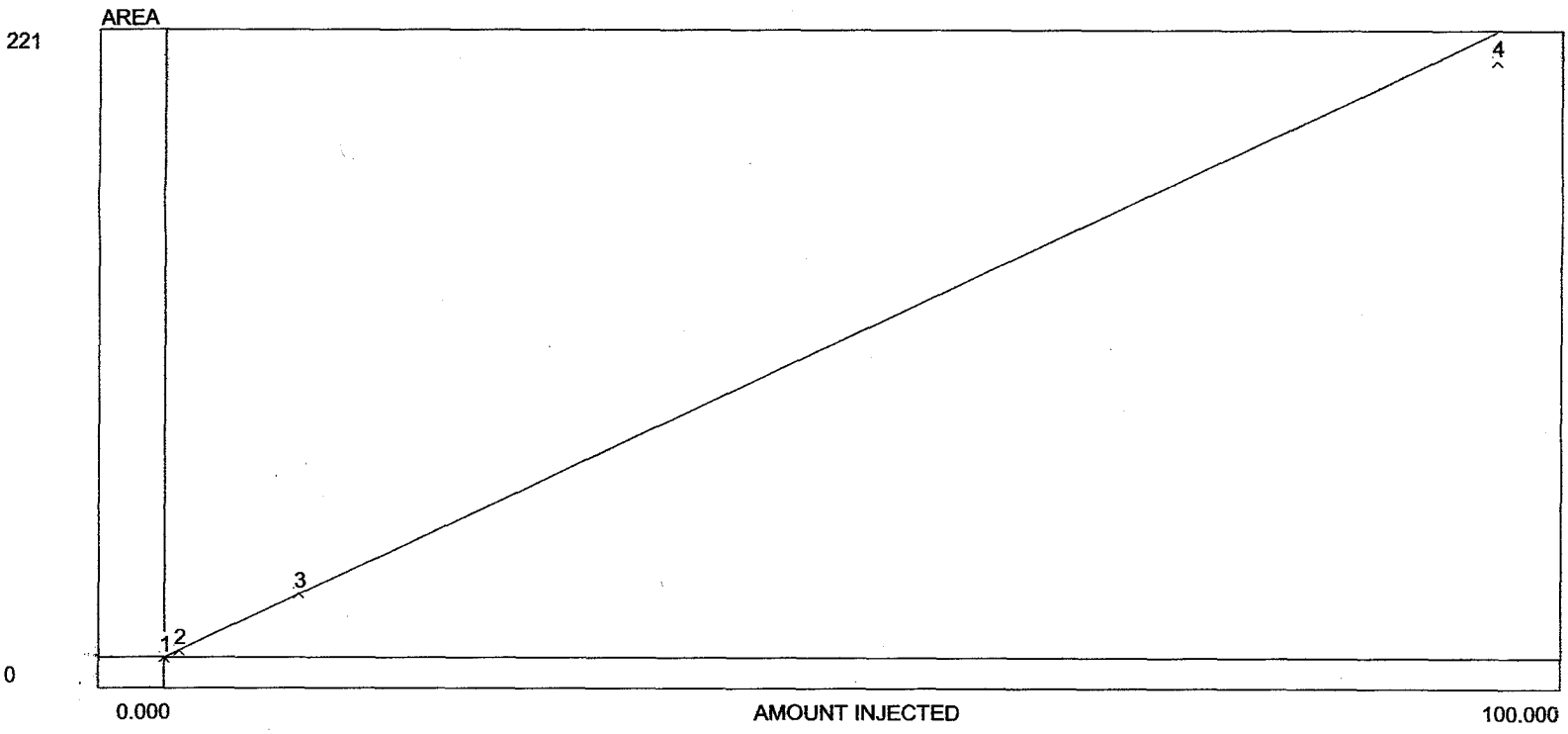
Avg slope of curve: 0.42
Y-axis intercept: -0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 0.2/66.7
Y=0.4203X
r2: 1.0000
Last calibrated: Mon Oct 23 13:17:46 2017

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	0.451	1.100	0.410	0.451	N/A	N/A
3	4.290	10.100	0.425	4.290	N/A	N/A
4	42.600	100.000	0.426	42.600	N/A	N/A

Component file: et02-100.cpt

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.300		0.000	
2	Ambient H2O	0.300	0.430		0.000	
3	Ethylene Oxide	0.430	0.550	C:\peak359\2Ster	0.000	7.cappm
4	Acetaldehyde	0.550	0.800		0.000	
5	CO2	0.800	1.000		0.000	

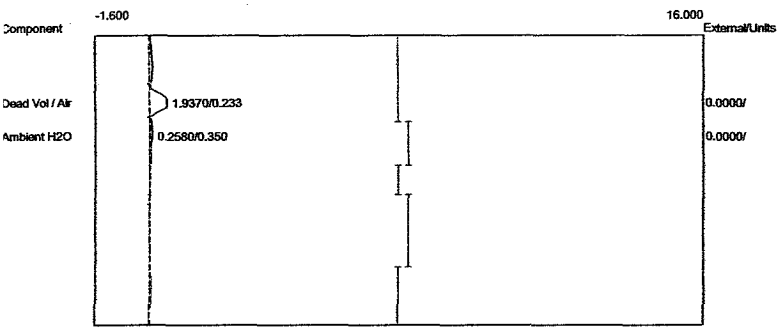
Calibration file: C:\peak359\2SterQ2017.cal



Avg slope of curve: 2.32
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 1.2/66.8
Y=2.3161X
r2: 1.0000
Last calibrated: Mon Oct 23 13:17:06 2017

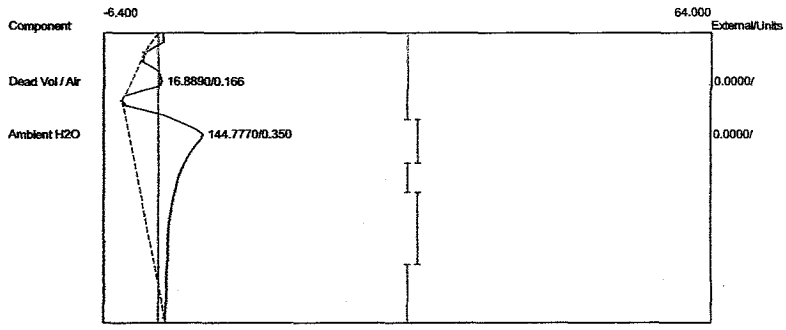
Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	2.620	1.100	2.382	2.620	N/A	N/A
3	23.800	10.100	2.356	23.800	N/A	N/A
4	221.000	100.000	2.210	221.000	N/A	N/A

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 12:41:24
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



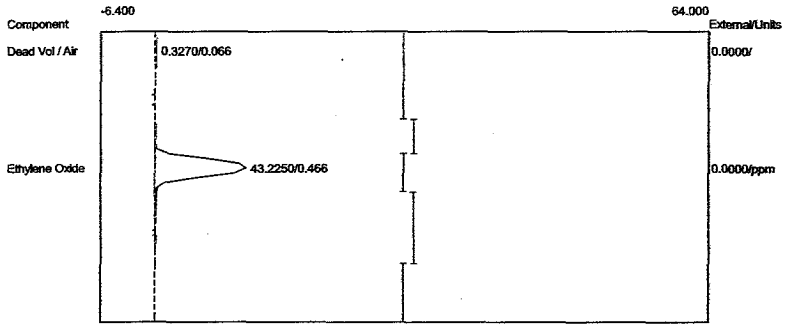
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.9370	0.0000	
Ambient H2O	0.350	0.2580	0.0000	
		2.1950	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 12:41:24
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



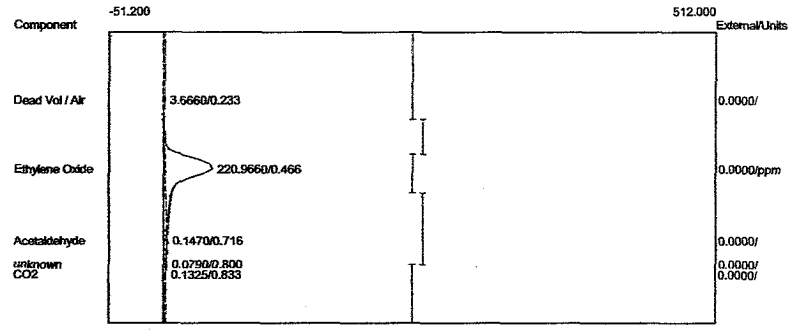
Component	Retention	Area	External	Units
Dead Vol / Air	0.166	16.8890	0.0000	
Ambient H2O	0.350	144.7770	0.0000	
		161.6660	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 12:44:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C01.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



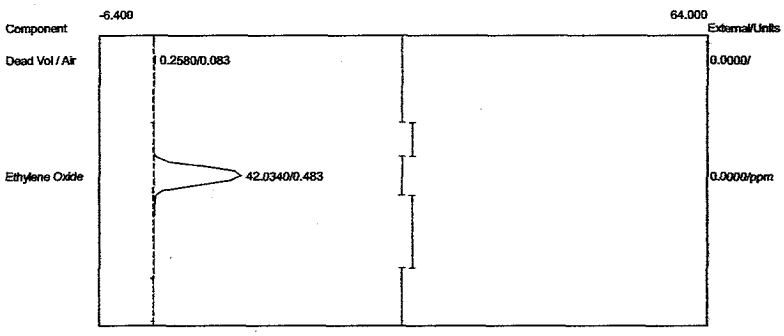
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.3270	0.0000	
Ethylene Oxide	0.466	43.2250	0.0000	ppm
		43.5520	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 12:44:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C01.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



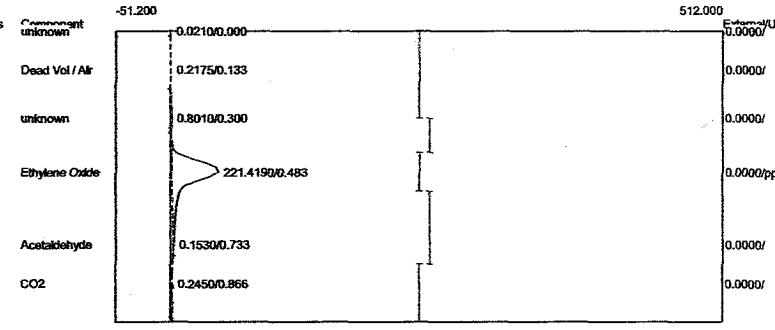
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.6660	0.0000	
Ethylene Oxide	0.466	220.9660	0.0000	ppm
Acetaldehyde	0.716	0.1470	0.0000	
CO2	0.833	0.1325	0.0000	
		224.9115	0.0000	

Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 12:53:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C02.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



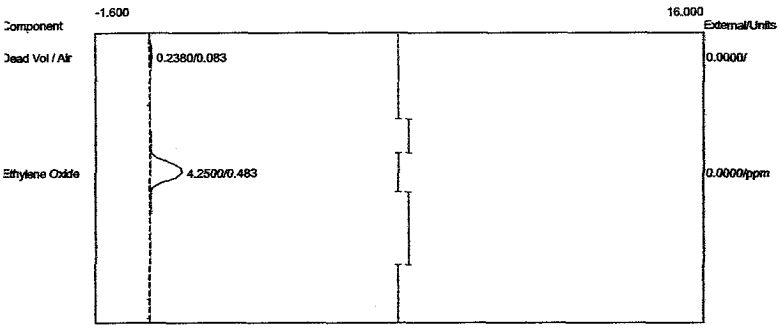
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.2580	0.0000	
Ethylene Oxide	0.483	42.0340	0.0000	ppm
		42.2920	0.0000	

Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 12:53:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C02.CHR (c:\peak359)
Sample: 100 ppm EtO std
Operator: D. Kremer



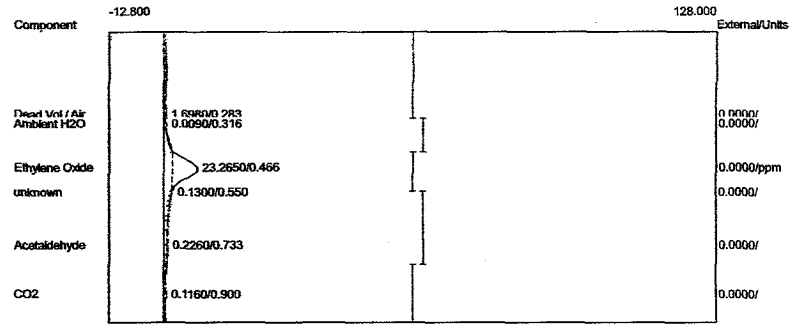
Component	Retention	Area	External	Units
Dead Vol / Air	0.133	0.2175	0.0000	
Ethylene Oxide	0.483	221.4190	0.0000	ppm
Acetaldehyde	0.733	0.1530	0.0000	
CO2	0.866	0.2450	0.0000	
		222.0345	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 12:59:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C03.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



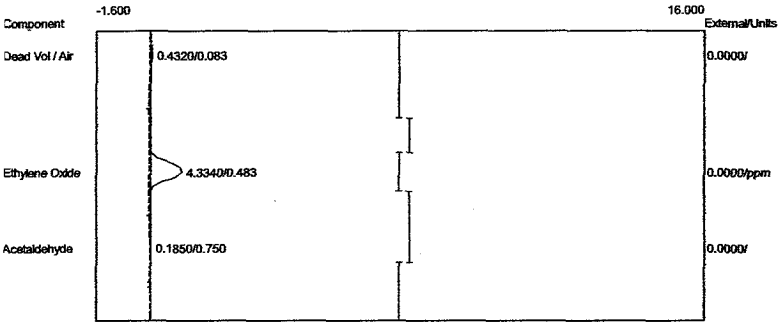
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.2380	0.0000	
Ethylene Oxide	0.483	4.2500	0.0000	ppm
		4.4880	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 12:59:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C03.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



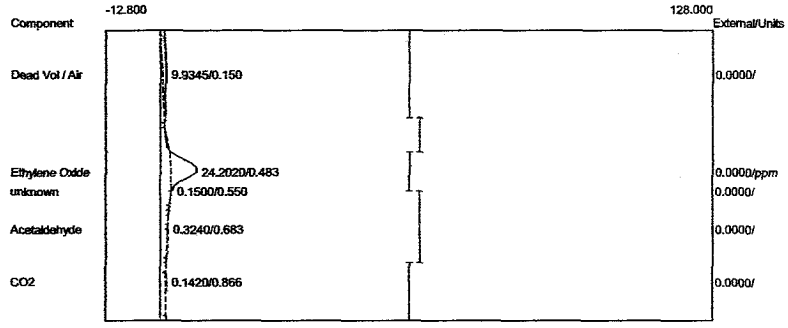
Component	Retention	Area	External	Units
Dead Vol / Air	0.283	1.6980	0.0000	
Ambient H2O	0.316	0.0090	0.0000	
Ethylene Oxide	0.466	23.2650	0.0000	ppm
Acetaldehyde	0.733	0.2260	0.0000	
CO2	0.900	0.1160	0.0000	
		25.3140	0.0000	

Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 13:03:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C04.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



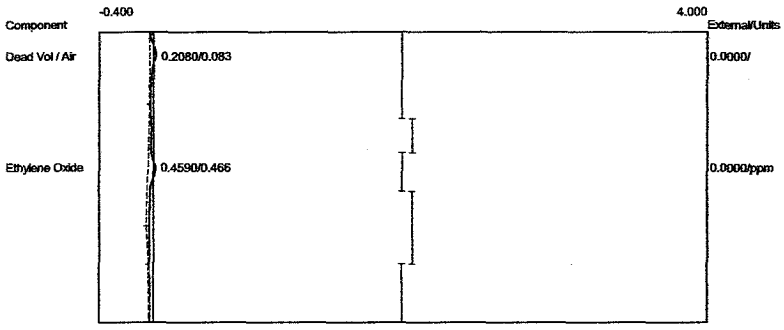
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.4320	0.0000	
Ethylene Oxide	0.483	4.3340	0.0000	ppm
Acetaldehyde	0.750	0.1850	0.0000	
		4.9510	0.0000	

Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 13:03:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C04.CHR (c:\peak359)
Sample: 10.1 ppm EtO std
Operator: D. Kremer



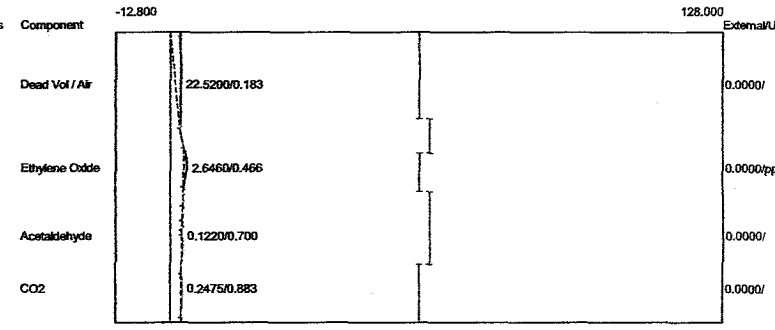
Component	Retention	Area	External	Units
Dead Vol / Air	0.150	9.9345	0.0000	
Ethylene Oxide	0.483	24.2020	0.0000	ppm
Acetaldehyde	0.683	0.3240	0.0000	
CO2	0.866	0.1420	0.0000	
		34.6025	0.0000	

Lab Name: ESC
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 13:08:33
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C05.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



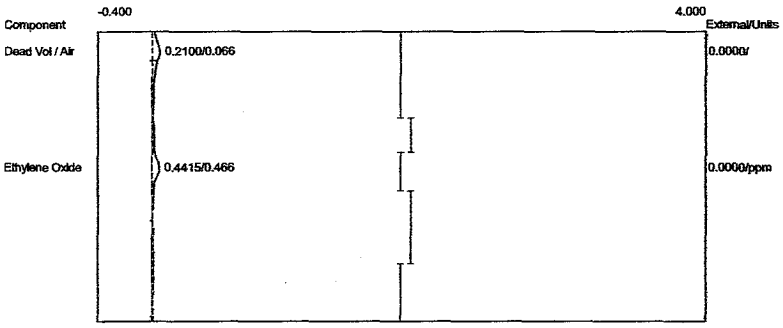
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.2080	0.0000	
Ethylene Oxide	0.466	0.4590	0.0000	ppm
		0.6670	0.0000	

Lab Name: ESC
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 13:08:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C05.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



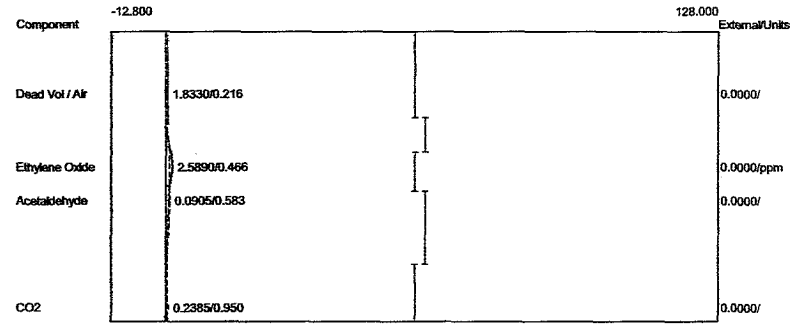
Component	Retention	Area	External	Units
Dead Vol / Air	0.183	22.5200	0.0000	
Ethylene Oxide	0.466	2.6460	0.0000	ppm
Acetaldehyde	0.700	0.1220	0.0000	
CO2	0.883	0.2475	0.0000	
		25.5355	0.0000	

Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 13:11:25
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C06.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



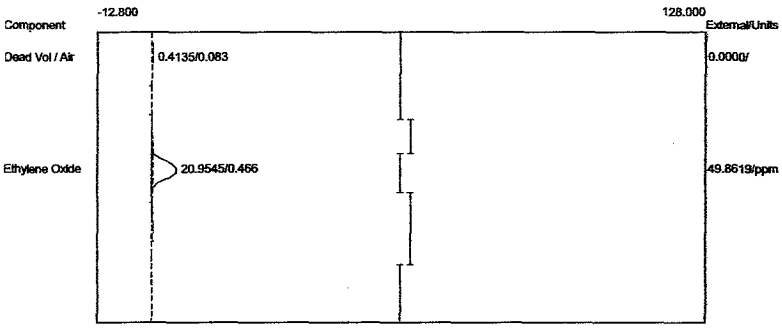
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.2100	0.0000	
Ethylene Oxide	0.466	0.4415	0.0000	ppm
		0.6515	0.0000	

Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 13:11:25
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C06.CHR (c:\peak359)
Sample: 1.10 ppm EtO std
Operator: D. Kremer



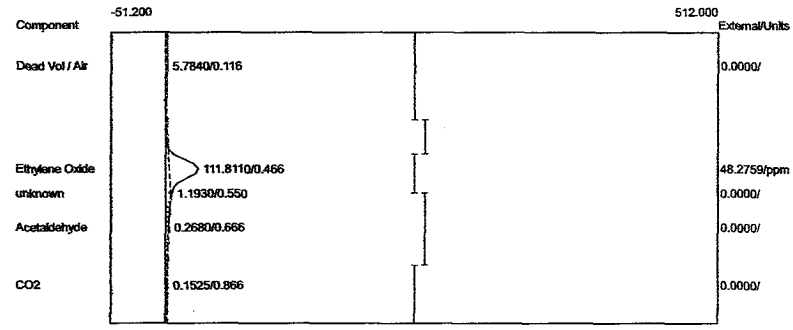
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8330	0.0000	
Ethylene Oxide	0.466	2.5890	0.0000	ppm
Acetaldehyde	0.583	0.0905	0.0000	
CO2	0.950	0.2385	0.0000	
		4.7510	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 13:18:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C07.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



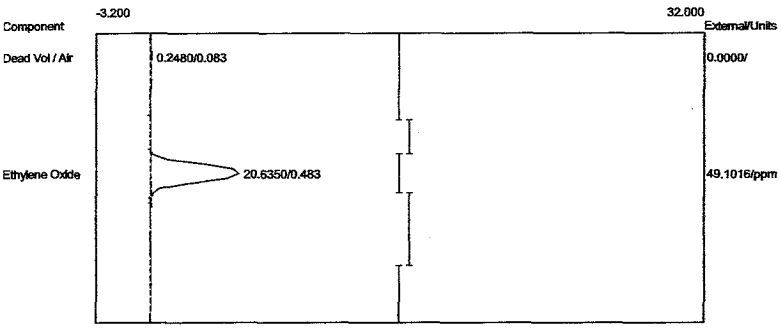
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.4135	0.0000	
Ethylene Oxide	0.466	20.9545	49.8619	ppm
		21.3680	49.8619	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 10/23/2017 13:18:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C07.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



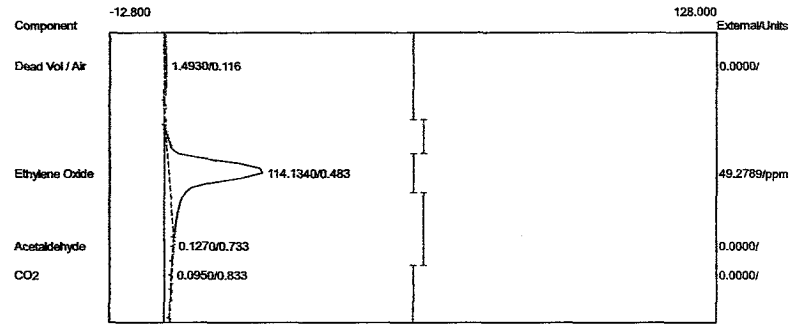
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	5.7840	0.0000	
Ethylene Oxide	0.466	111.8110	48.2759	ppm
Acetaldehyde	0.666	0.2680	0.0000	
CO2	0.866	0.1525	0.0000	
		118.0155	48.2759	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: MidCal
Analysis date: 10/24/2017 08:30:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C08.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



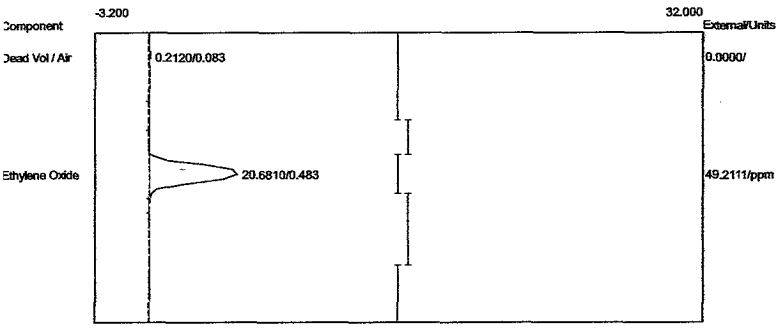
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.2480	0.0000	
Ethylene Oxide	0.483	20.6350	49.1016	ppm
		20.8830	49.1016	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: MidCal
Analysis date: 10/24/2017 08:30:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C08.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



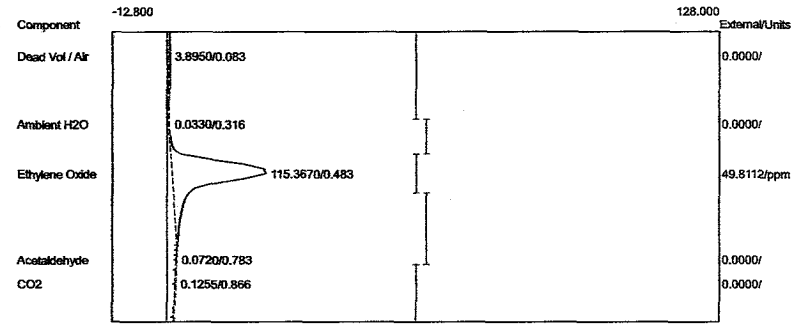
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	1.4930	0.0000	
Ethylene Oxide	0.483	114.1340	49.2789	ppm
Acetaldehyde	0.733	0.1270	0.0000	
CO2	0.833	0.0950	0.0000	
		115.8490	49.2789	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PostCal
Analysis date: 10/24/2017 13:45:53
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-C09.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.2120	0.0000	
Ethylene Oxide	0.483	20.6810	49.2111	ppm
		20.8930	49.2111	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PostCal
Analysis date: 10/24/2017 13:45:53
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-C09.CHR (c:\peak359)
Sample: 48.8 ppm EtO std
Operator: D. Kremer

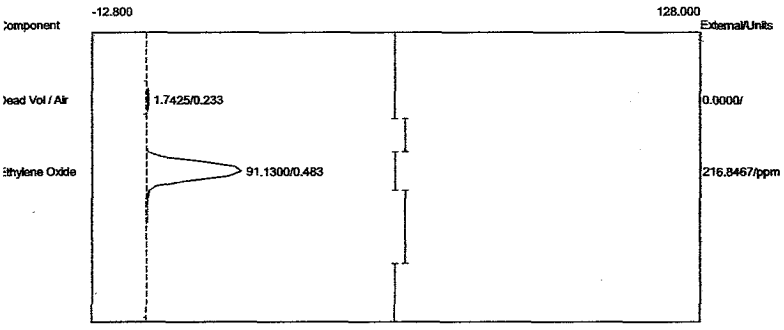


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	3.8950	0.0000	
Ambient H2O	0.316	0.0330	0.0000	
Ethylene Oxide	0.483	115.3670	49.8112	ppm
Acetaldehyde	0.783	0.0720	0.0000	
CO2	0.866	0.1255	0.0000	
		119.4925	49.8112	

APPENDIX B

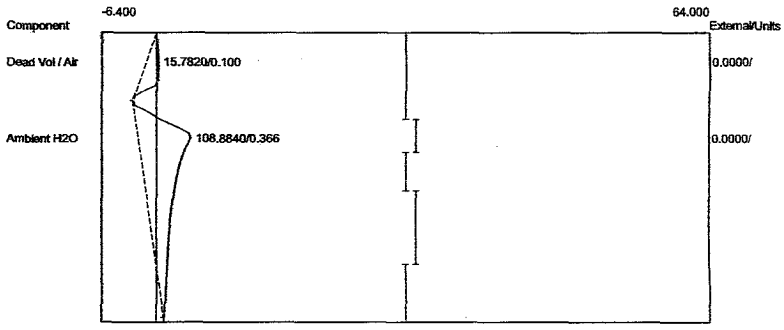
Run #1 Chromatograms – Backvent

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:10:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



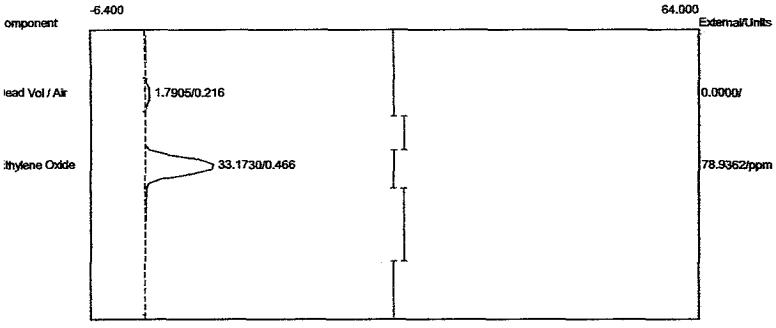
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7425	0.0000	
Ethylene Oxide	0.483	91.1300	216.8467	ppm
		92.8725	216.8467	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:10:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



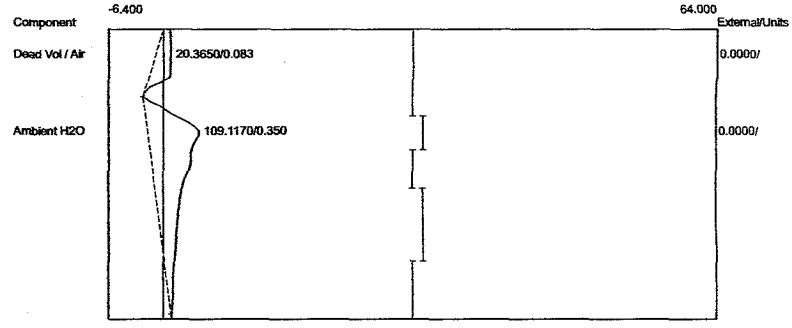
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	15.7820	0.0000	
Ambient H2O	0.366	108.8840	0.0000	
		124.6660	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:11:09
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



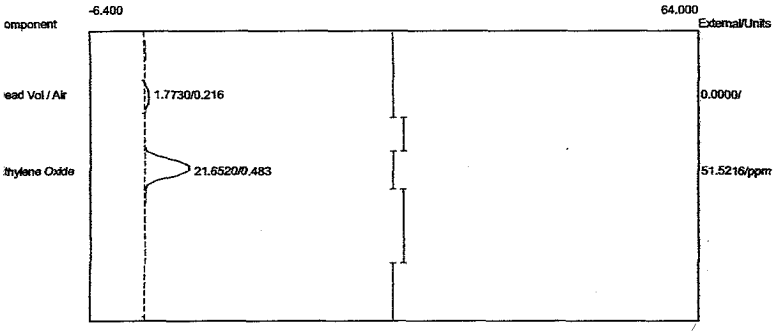
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7905	0.0000	
Ethylene Oxide	0.466	33.1730	78.9362	ppm
		34.9635	78.9362	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:11:09
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



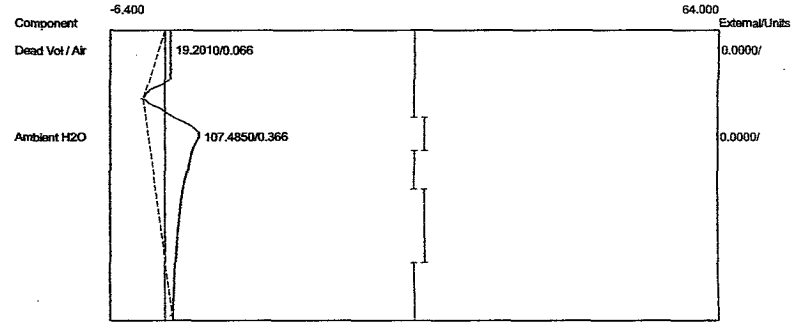
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	20.3650	0.0000	
Ambient H2O	0.350	109.1170	0.0000	
		129.4820	0.0000	

Lab name: ESC
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:12:34
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



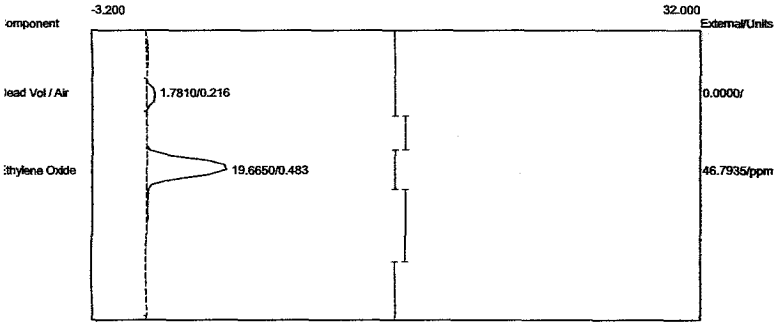
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7730	0.0000	
Ethylene Oxide	0.483	21.6520	51.5216	ppm
		23.4250	51.5216	

Lab name: ESC
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:12:34
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



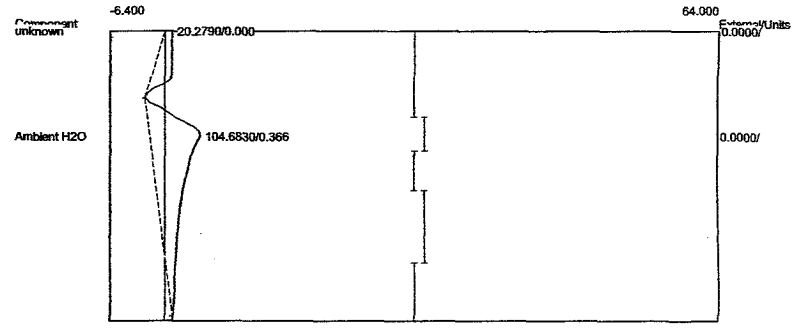
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	19.2010	0.0000	
Ambient H2O	0.366	107.4850	0.0000	
		126.6860	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:13:39
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



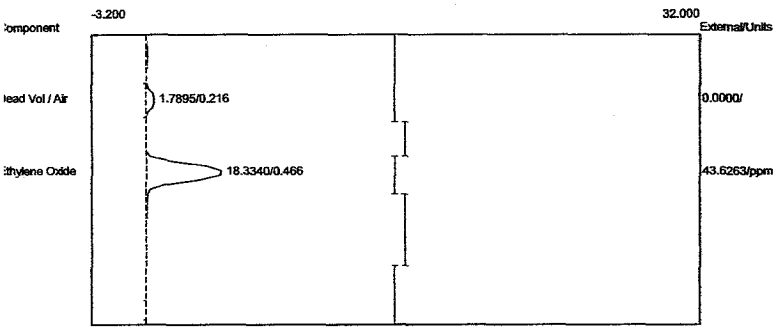
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7810	0.0000	
Ethylene Oxide	0.483	19.6650	46.7935	ppm
		21.4460	46.7935	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:13:39
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



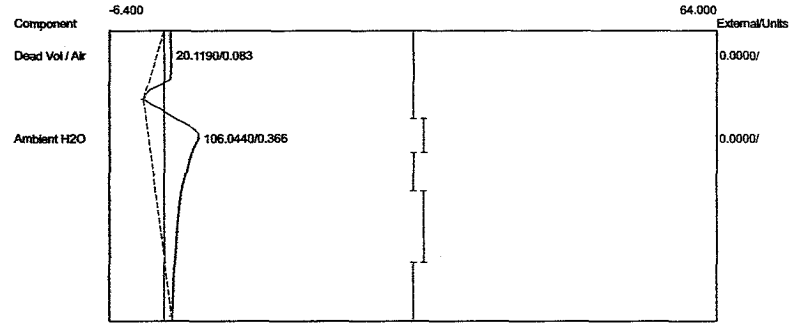
Component	Retention	Area	External	Units
Ambient H2O	0.366	104.6830	0.0000	
		104.6830	0.0000	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:14:46
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



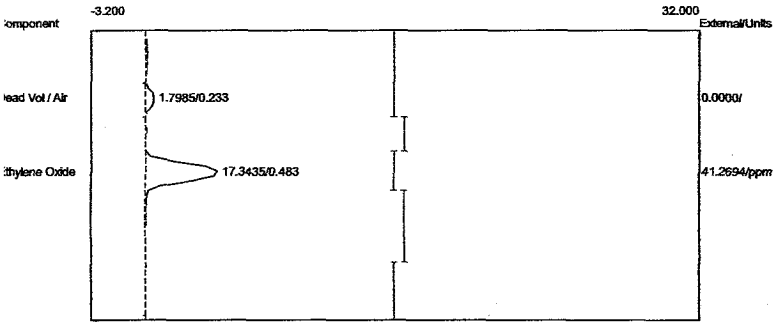
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7895	0.0000	
Ethylene Oxide	0.466	18.3340	43.6263	ppm
		20.1235	43.6263	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:14:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



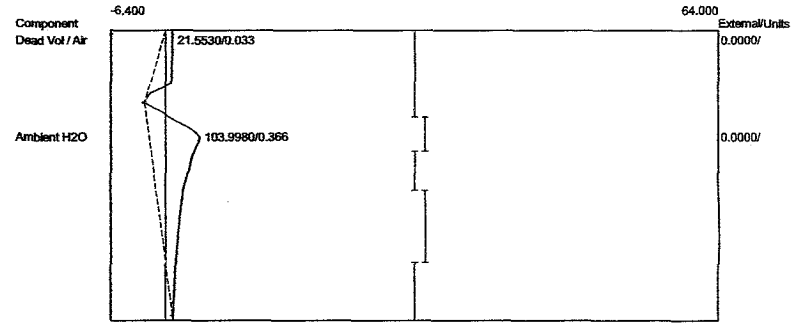
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	20.1190	0.0000	
Ambient H2O	0.366	106.0440	0.0000	
		126.1630	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:15:52
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



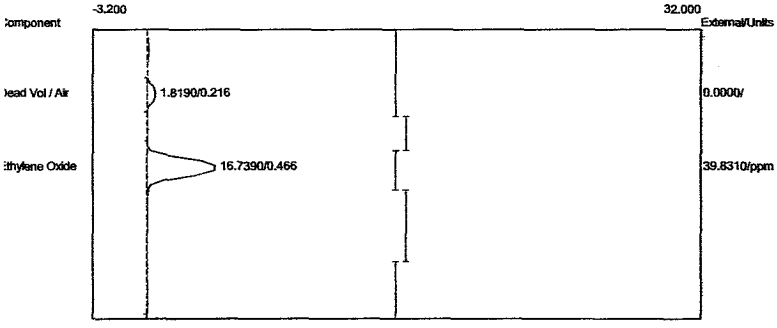
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7985	0.0000	
Ethylene Oxide	0.483	17.3435	41.2694	ppm
		19.1420	41.2694	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:15:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



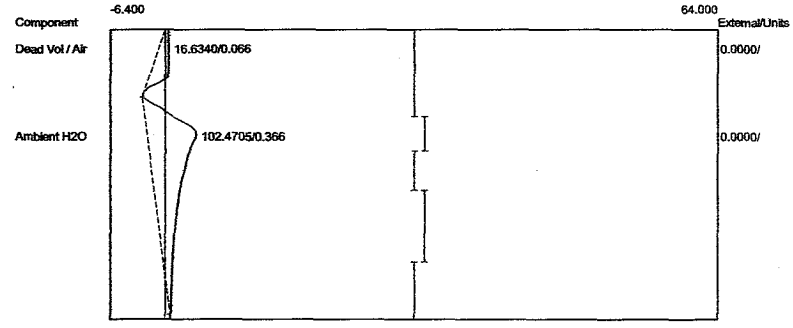
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	21.5530	0.0000	
Ambient H2O	0.366	103.9980	0.0000	
		125.5510	0.0000	

Lab name: ECS
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:17:22
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



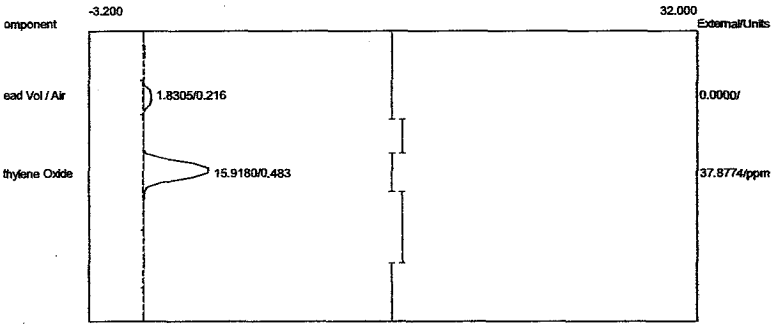
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8190	0.0000	
Ethylene Oxide	0.466	16.7390	39.8310	ppm
		18.5580	39.8310	

Lab name: ECS
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:17:22
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



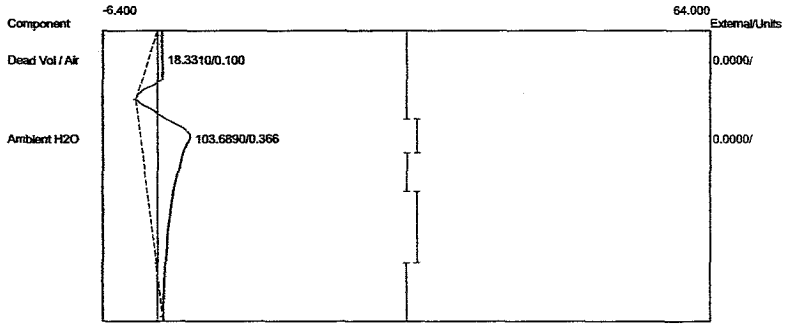
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	16.6340	0.0000	
Ambient H2O	0.366	102.4705	0.0000	
		119.1045	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:18:32
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



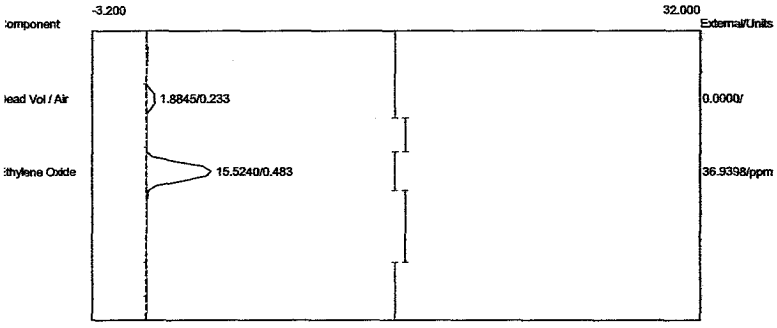
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8305	0.0000	
Ethylene Oxide	0.483	15.9180	37.8774	ppm
		17.7485	37.8774	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:18:32
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



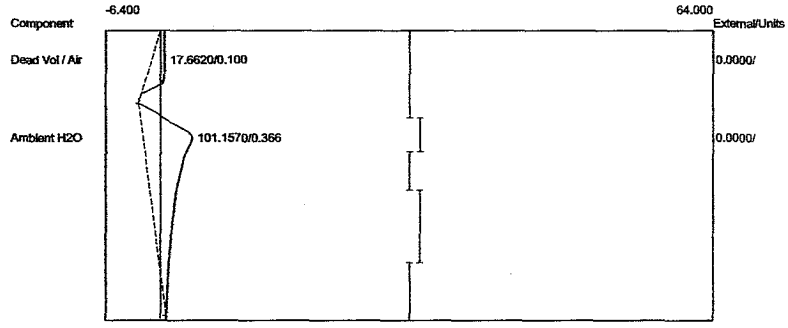
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	18.3310	0.0000	
Ambient H2O	0.366	103.6890	0.0000	
		122.0200	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:19:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



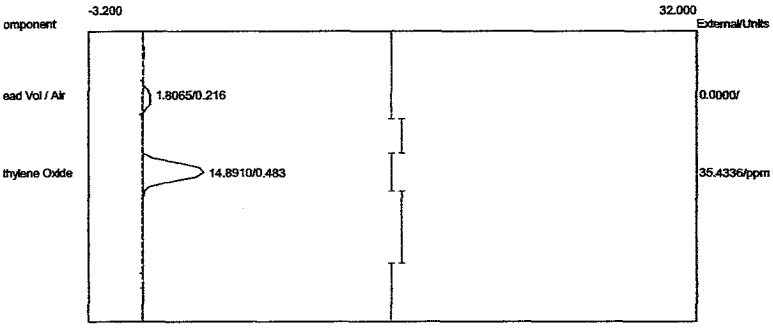
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8845	0.0000	
Ethylene Oxide	0.483	15.5240	36.9398	ppm
		17.4085	36.9398	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:19:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



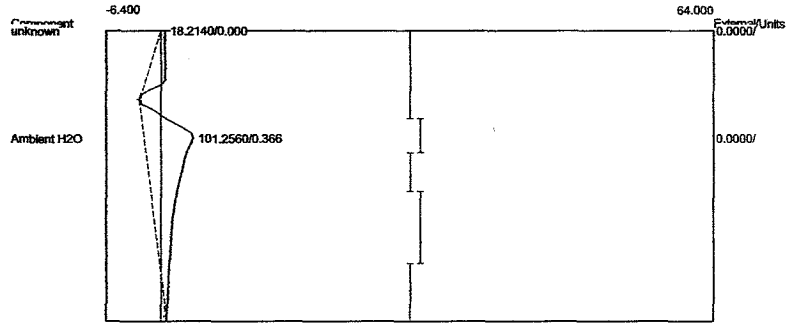
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	17.6620	0.0000	
Ambient H2O	0.366	101.1570	0.0000	
		118.8190	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:20:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



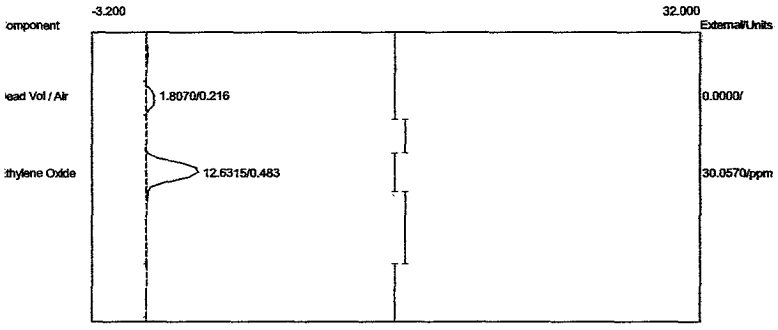
Component	Retention	Area	External	Units
)ead Vol / Air	0.216	1.8065	0.0000	
Ethylene Oxide	0.483	14.8910	35.4336	ppm
		16.6975	35.4336	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:20:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



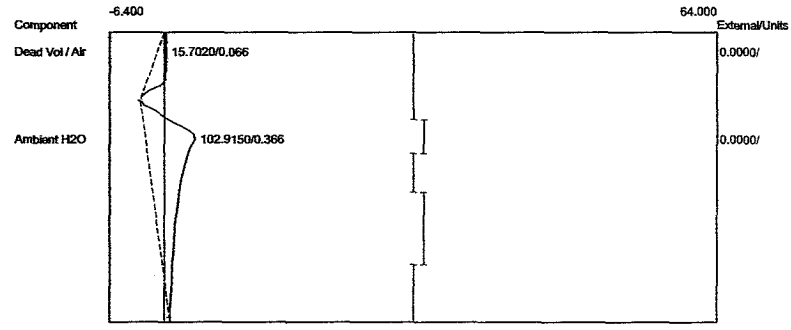
Component	Retention	Area	External	Units
Ambient H2O	0.366	101.2560	0.0000	
		101.2560	0.0000	

Lab name: ECS
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:22:28
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



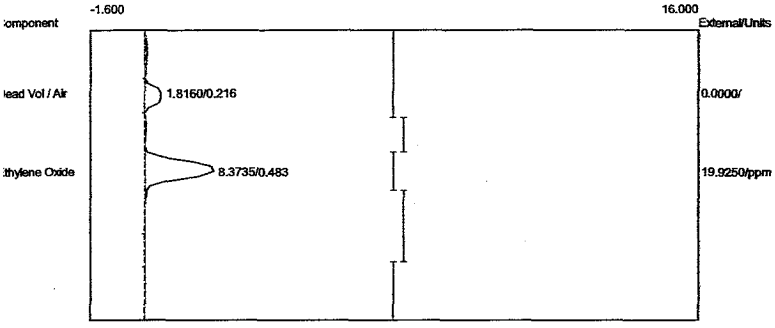
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8070	0.0000	
Ethylene Oxide	0.483	12.6315	30.0570	ppm
		14.4385	30.0570	

Lab name: ECS
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:22:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



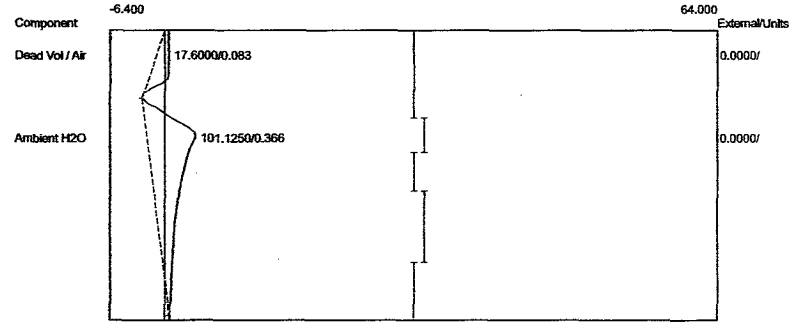
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	15.7020	0.0000	
Ambient H2O	0.366	102.9150	0.0000	
		118.6170	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:23:39
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1B12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8160	0.0000	
Ethylene Oxide	0.483	8.3735	19.9250	ppm
		10.1895	19.9250	

Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 10/24/2017 10:23:39
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1B12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer

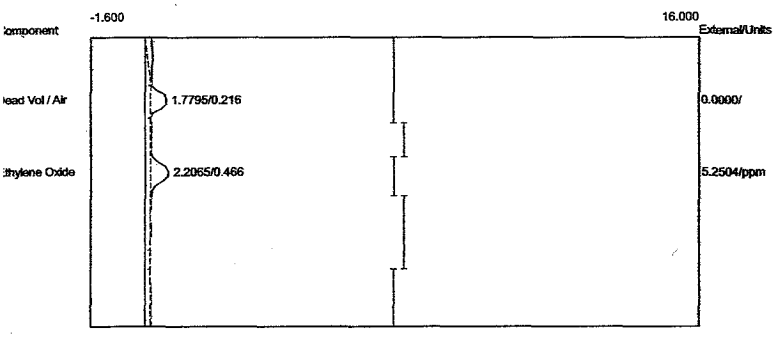


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	17.6000	0.0000	
Ambient H2O	0.366	101.1250	0.0000	
		118.7250	0.0000	

APPENDIX C

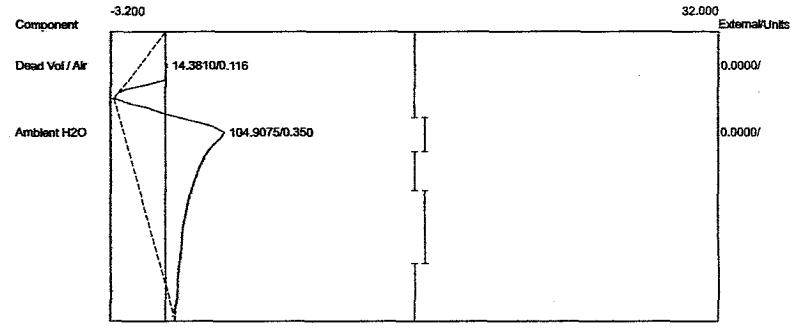
Run #1 Chromatograms – Aeration

Lab name: ESSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 08:47:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



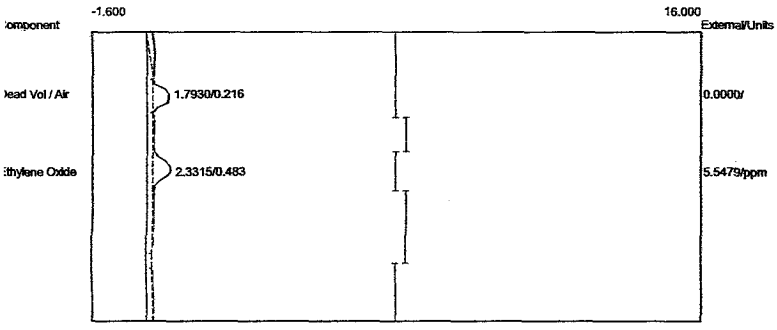
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7795	0.0000	
Ethylene Oxide	0.466	2.2065	5.2504	ppm
		3.9860	5.2504	

Lab name: ESSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 08:47:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



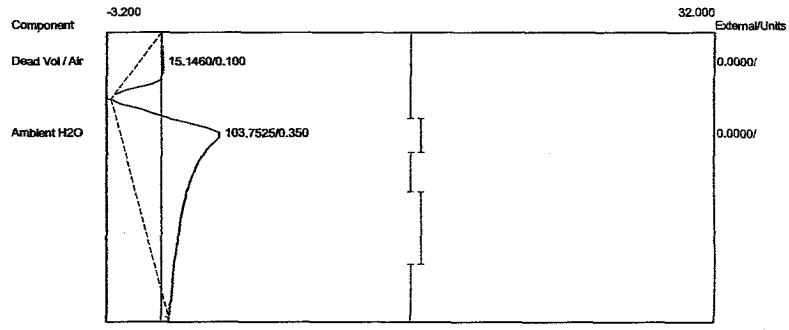
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	14.3810	0.0000	
Ambient H2O	0.350	104.9075	0.0000	
		119.2885	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 08:52:19
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



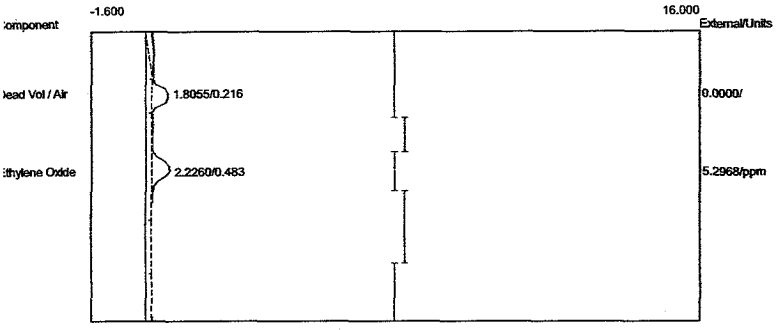
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7930	0.0000	
Ethylene Oxide	0.483	2.3315	5.5479	ppm
		4.1245	5.5479	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 08:52:19
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



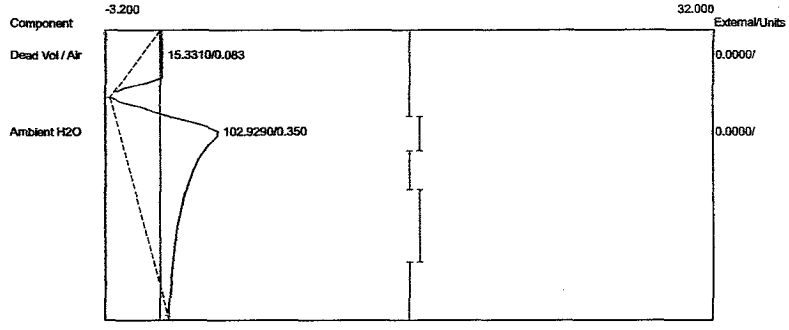
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	15.1460	0.0000	
Ambient H2O	0.350	103.7525	0.0000	
		118.8985	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 08:57:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



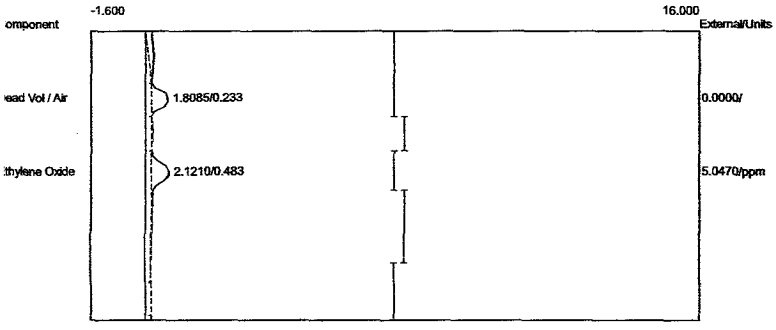
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8055	0.0000	
Ethylene Oxide	0.483	2.2260	5.2968	ppm
		4.0315	5.2968	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 08:57:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



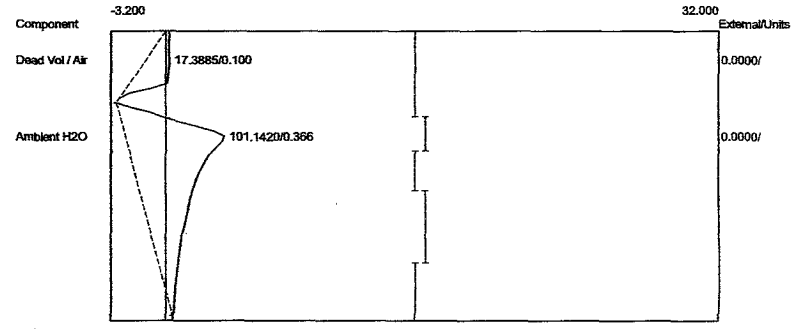
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	15.3310	0.0000	
Ambient H2O	0.350	102.9290	0.0000	
		118.2600	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:02:10
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



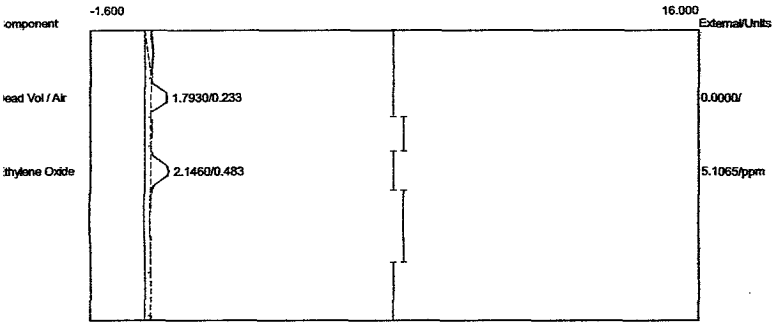
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8085	0.0000	
Ethylene Oxide	0.483	2.1210	5.0470	ppm
		3.9295	5.0470	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:02:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



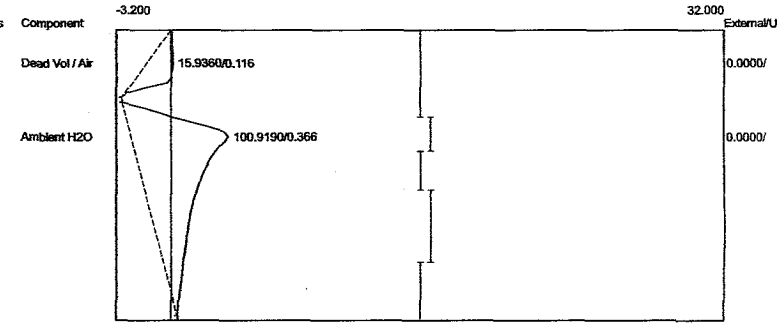
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	17.3885	0.0000	
Ambient H2O	0.366	101.1420	0.0000	
		118.5305	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:07:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



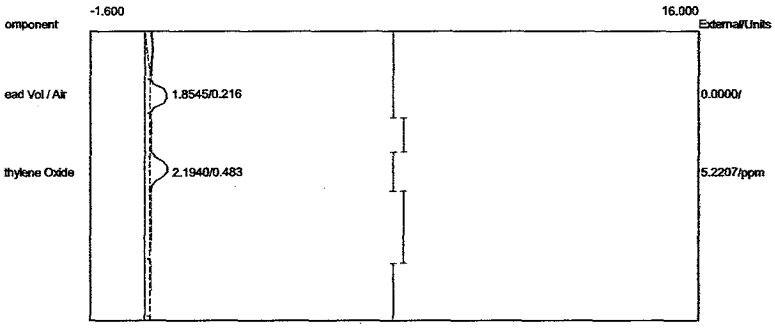
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7930	0.0000	
Ethylene Oxide	0.483	2.1460	5.1065	ppm
		3.9390	5.1065	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:07:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



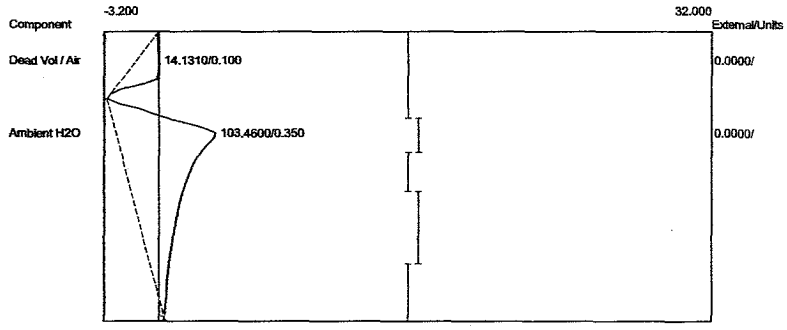
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	15.9360	0.0000	
Ambient H2O	0.366	100.9190	0.0000	
		116.8550	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:12:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



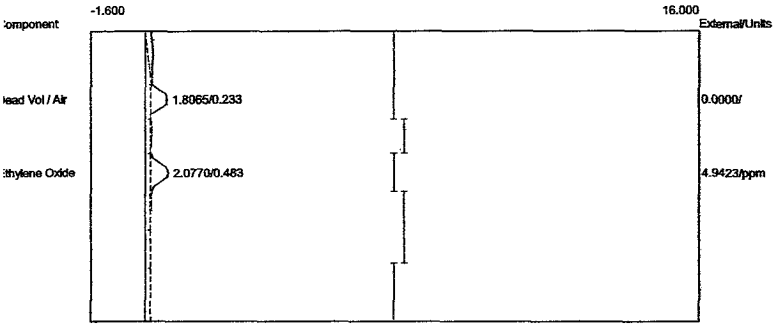
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8545	0.0000	
Ethylene Oxide	0.483	2.1940	5.2207	ppm
		4.0485	5.2207	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:12:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



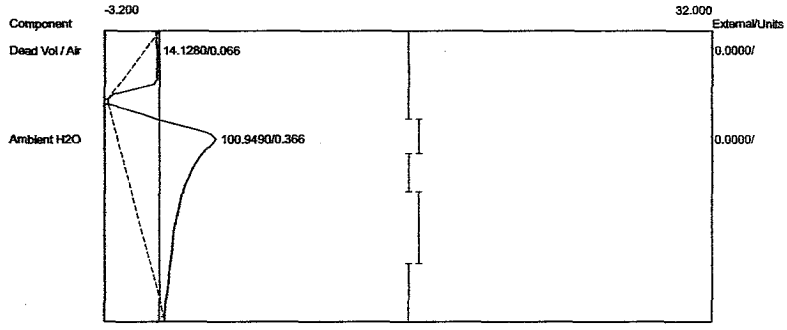
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	14.1310	0.0000	
Ambient H2O	0.350	103.4600	0.0000	
		117.5910	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:17:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



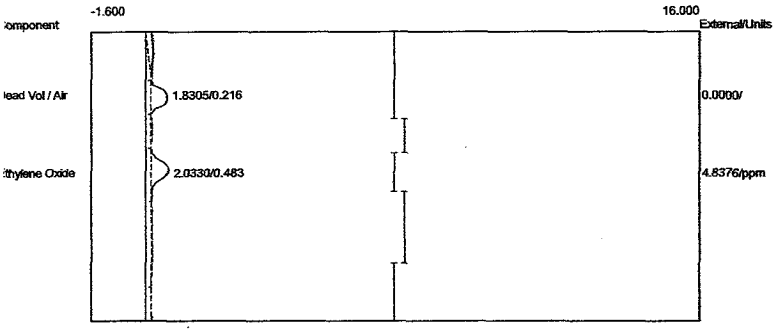
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8065	0.0000	
Ethylene Oxide	0.483	2.0770	4.9423	ppm
		3.8835	4.9423	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:17:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



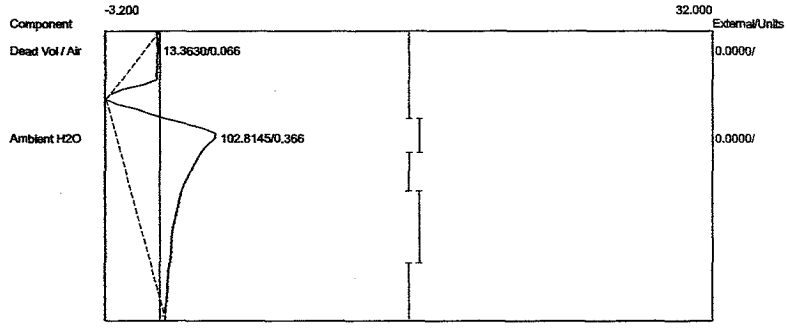
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	14.1280	0.0000	
Ambient H2O	0.366	100.9490	0.0000	
		115.0770	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:22:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



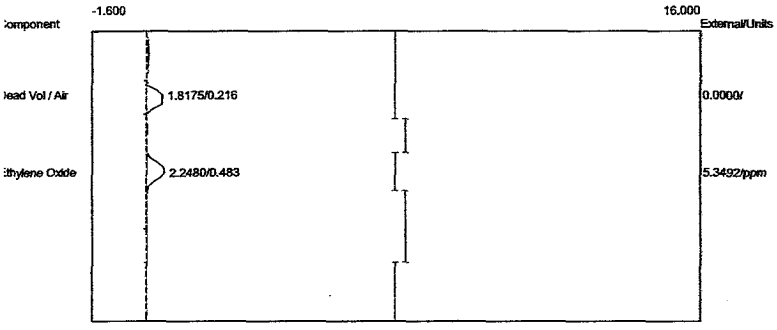
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8305	0.0000	
Ethylene Oxide	0.483	2.0330	4.8376	ppm
		3.8635	4.8376	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:22:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



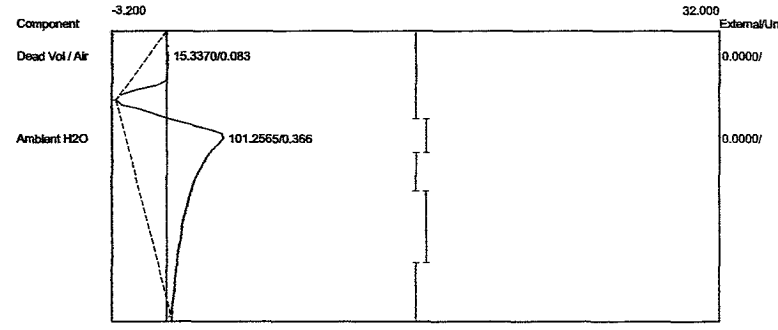
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	13.3630	0.0000	
Ambient H2O	0.366	102.8145	0.0000	
		116.1775	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:27:22
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



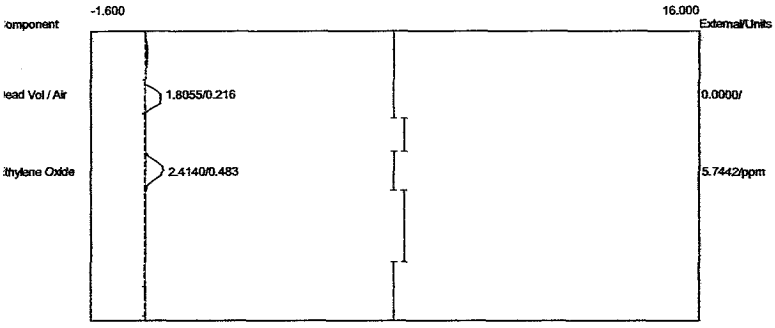
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8175	0.0000	
Ethylene Oxide	0.483	2.2480	5.3492	ppm
		4.0655	5.3492	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:27:22
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



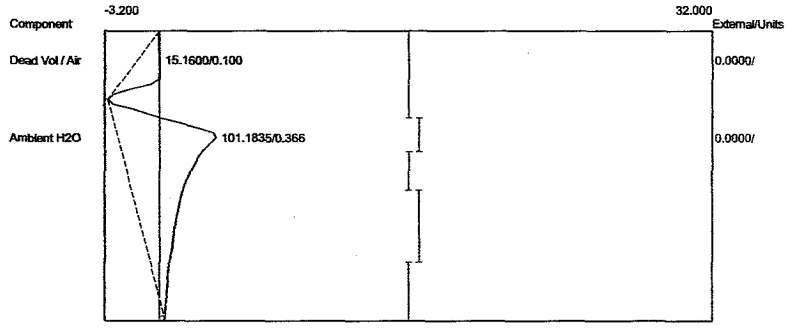
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	15.3370	0.0000	
Ambient H2O	0.366	101.2565	0.0000	
		116.5935	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:32:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



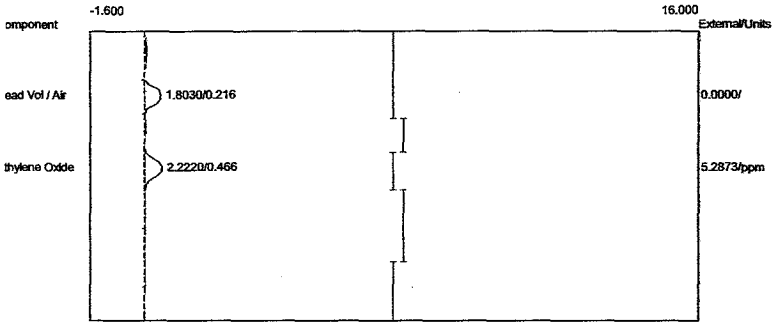
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8055	0.0000	
Ethylene Oxide	0.483	2.4140	5.7442	ppm
		4.2195	5.7442	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:32:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



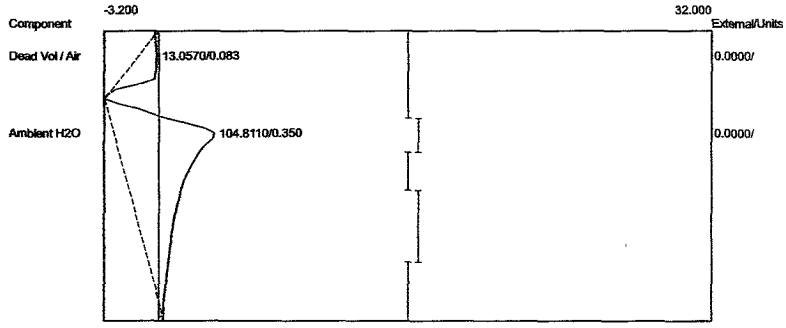
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	15.1600	0.0000	
Ambient H2O	0.366	101.1835	0.0000	
		116.3435	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:37:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8030	0.0000	
Ethylene Oxide	0.466	2.2220	5.2873	ppm
		4.0250	5.2873	

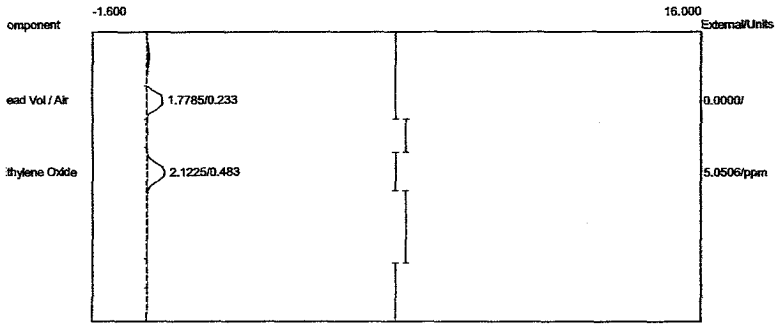
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:37:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	13.0570	0.0000	
Ambient H2O	0.350	104.8110	0.0000	
		117.8680	0.0000	

Lab name: ECC

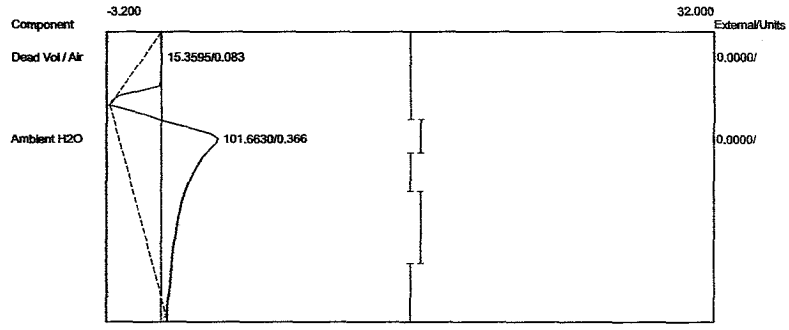
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:42:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-1A12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7785	0.0000	
Ethylene Oxide	0.483	2.1225	5.0506	ppm
		3.9010	5.0506	

Lab name: ECC

Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 10/24/2017 09:42:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-1A12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer

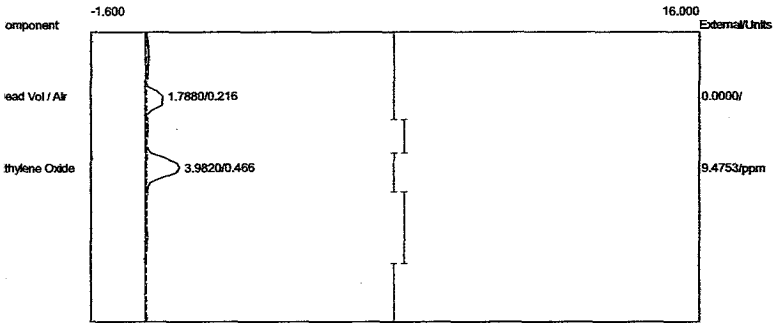


Component	Retention	Area	External	Units
Dead Vol / Air	0.083	15.3595	0.0000	
Ambient H2O	0.366	101.6630	0.0000	
		117.0225	0.0000	

APPENDIX D

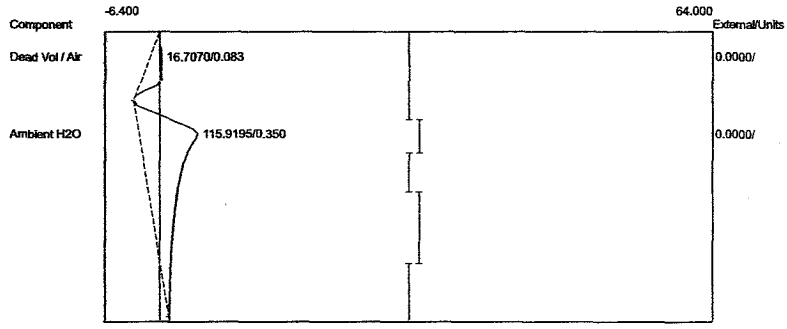
Run #2 Chromatograms – Backvent

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:32:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



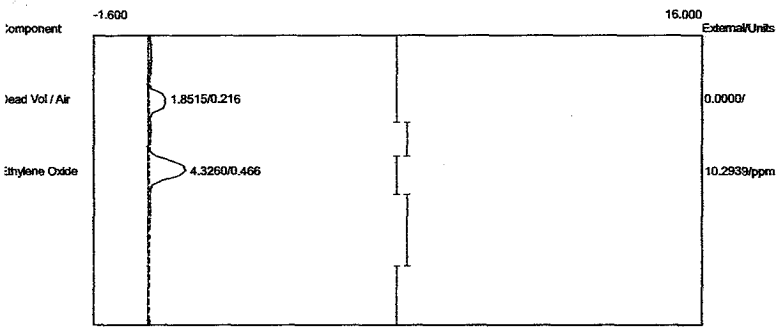
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7880	0.0000	
Ethylene Oxide	0.466	3.9820	9.4753	ppm
		5.7700	9.4753	

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:32:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



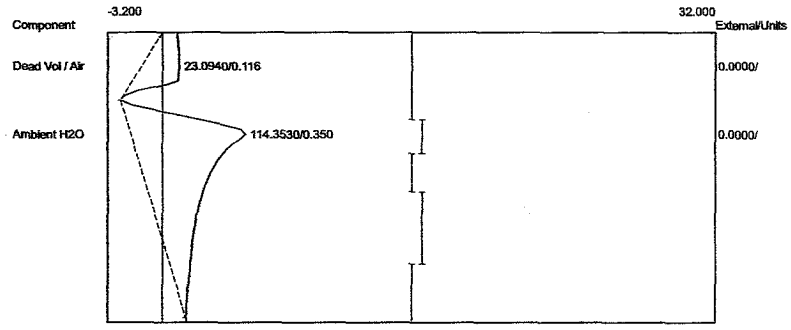
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	16.7070	0.0000	
Ambient H2O	0.350	115.9195	0.0000	
		132.6265	0.0000	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:33:52
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



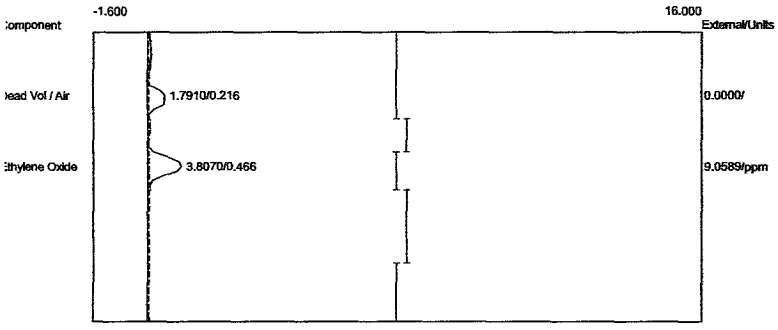
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8515	0.0000	
Ethylene Oxide	0.466	4.3260	10.2939	ppm
		6.1775	10.2939	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:33:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



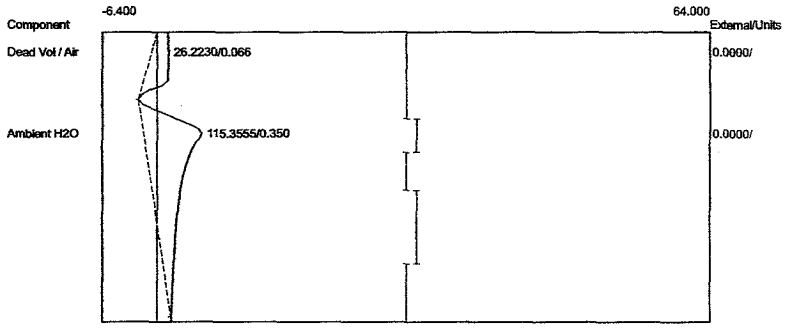
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	23.0940	0.0000	
Ambient H2O	0.350	114.3530	0.0000	
		137.4470	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:34:56
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



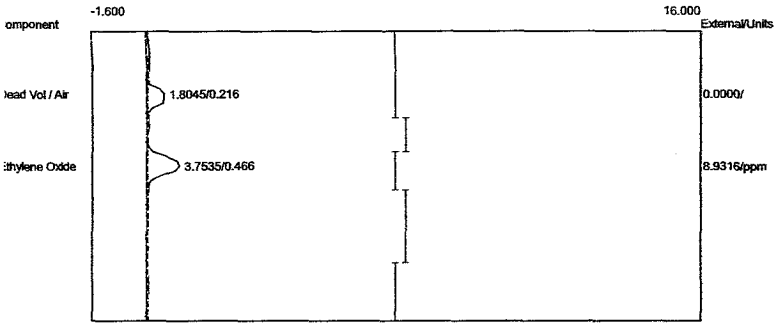
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7910	0.0000	
Ethylene Oxide	0.466	3.8070	9.0589	ppm
		5.5980	9.0589	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:34:56
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



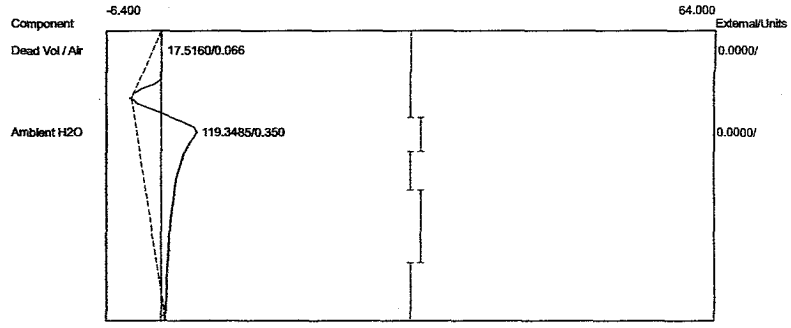
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	26.2230	0.0000	
Ambient H2O	0.350	115.3555	0.0000	
		141.5785	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:36:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



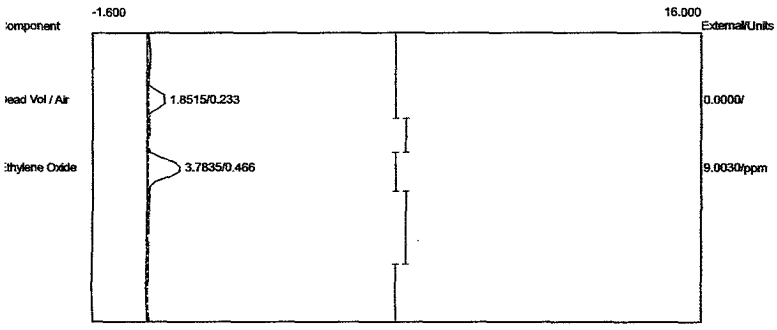
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8045	0.0000	
Ethylene Oxide	0.466	3.7535	8.9316	ppm
		5.5580	8.9316	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:36:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



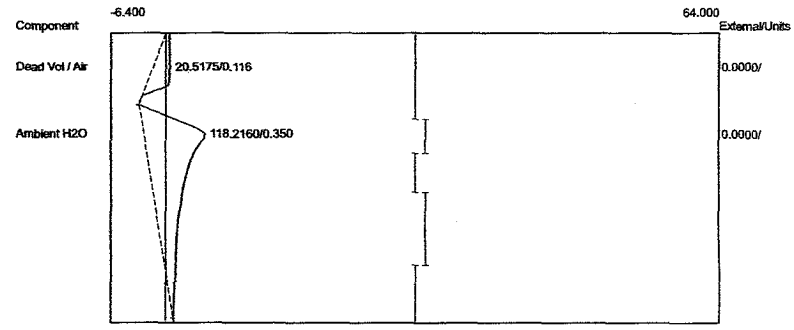
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	17.5160	0.0000	
Ambient H2O	0.350	119.3485	0.0000	
		136.8645	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:37:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



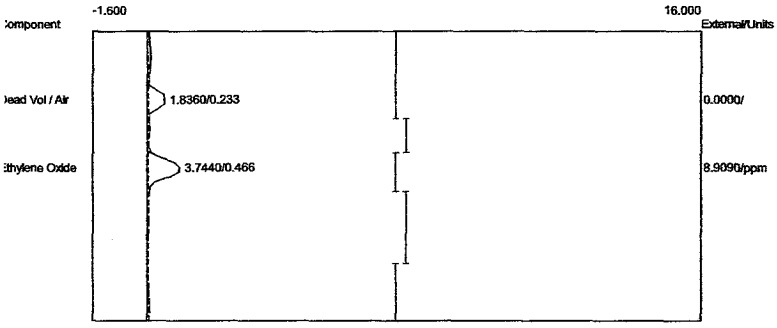
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8515	0.0000	
Ethylene Oxide	0.466	3.7835	9.0030	ppm
		5.6350	9.0030	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:37:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



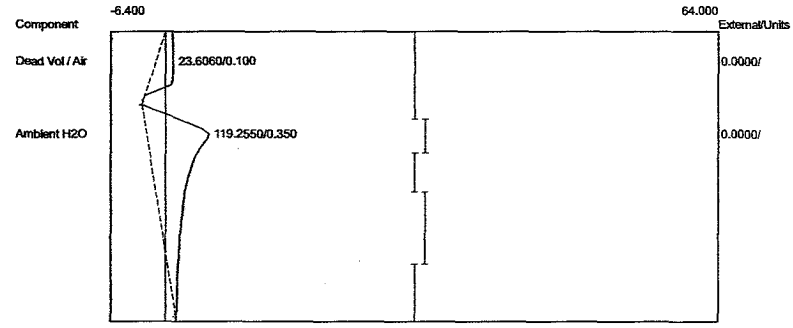
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	20.5175	0.0000	
Ambient H2O	0.350	118.2160	0.0000	
		138.7335	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:38:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



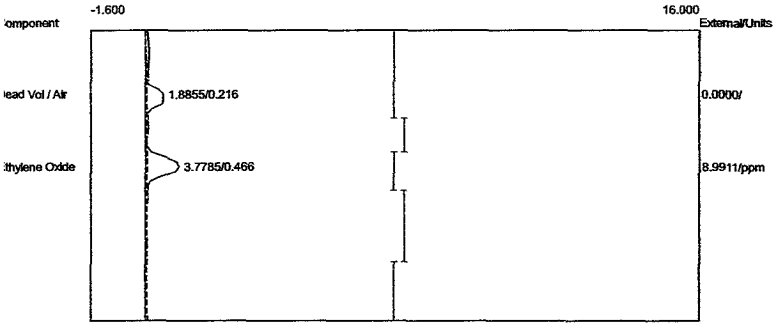
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8360	0.0000	
Ethylene Oxide	0.466	3.7440	8.9090	ppm
		5.5800	8.9090	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:38:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



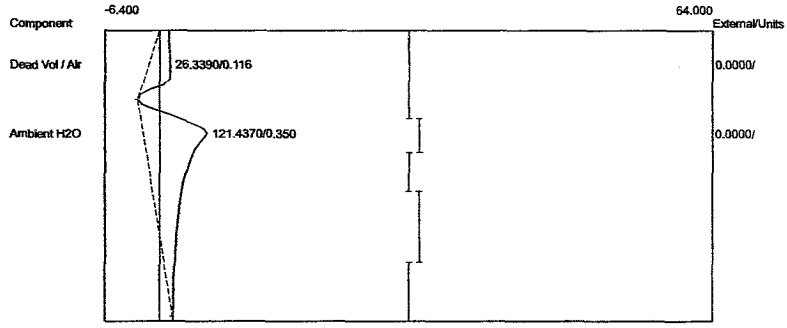
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	23.6060	0.0000	
Ambient H2O	0.350	119.2550	0.0000	
		142.8610	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:39:26
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



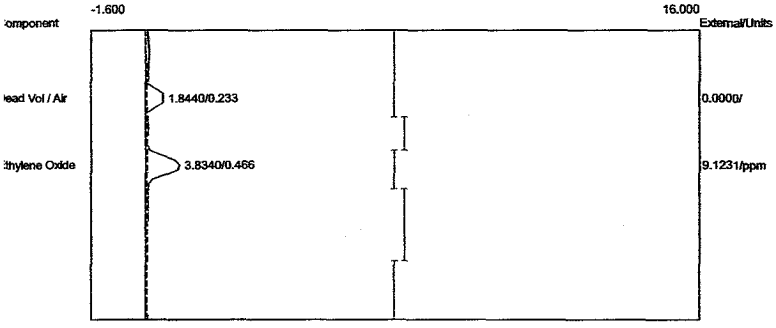
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8855	0.0000	
Ethylene Oxide	0.466	3.7785	8.9911	ppm
		5.6640	8.9911	

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:39:26
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



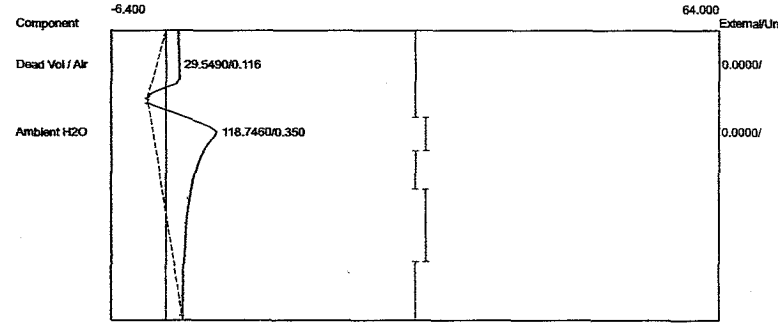
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	26.3390	0.0000	
Ambient H2O	0.350	121.4370	0.0000	
		147.7760	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:40:33
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



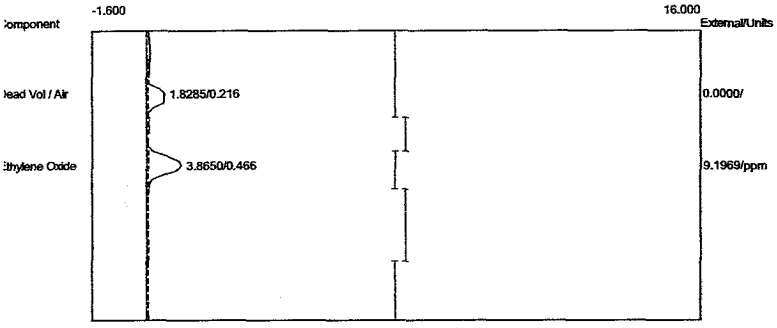
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8440	0.0000	
Ethylene Oxide	0.466	3.8340	9.1231	ppm
		5.6780	9.1231	

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:40:33
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



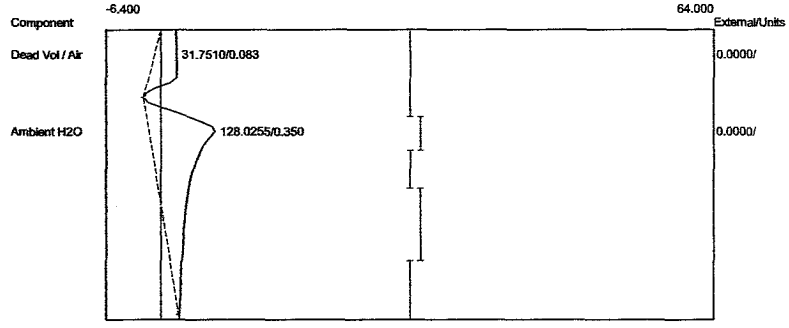
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	29.5490	0.0000	
Ambient H2O	0.350	118.7460	0.0000	
		148.2950	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:41:41
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



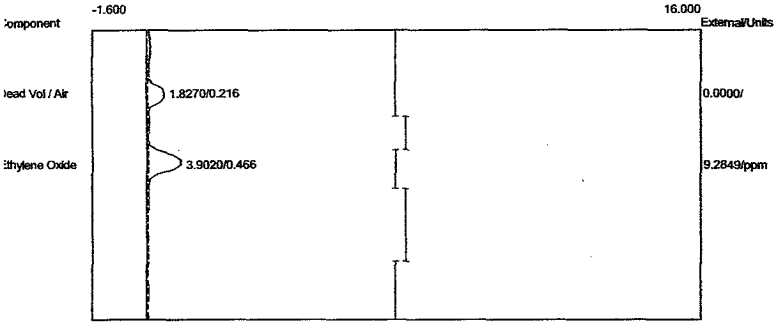
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8285	0.0000	
Ethylene Oxide	0.466	3.8650	9.1969	ppm
		5.6935	9.1969	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:41:41
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



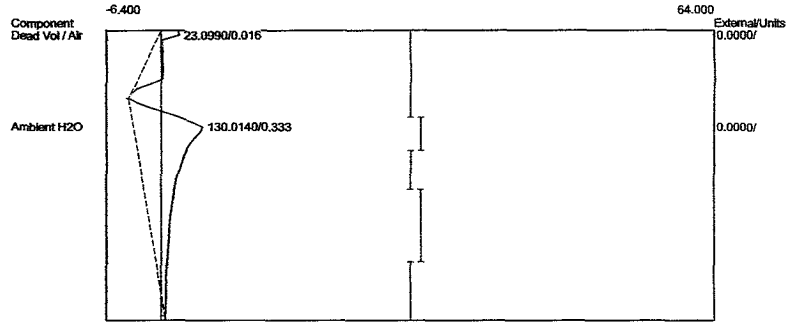
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	31.7510	0.0000	
Ambient H2O	0.350	128.0255	0.0000	
		159.7765	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:42:53
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



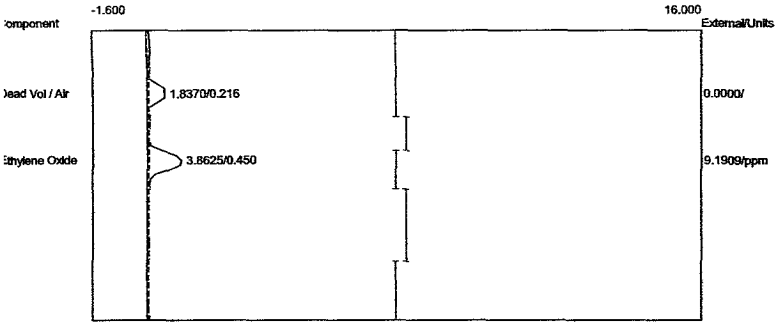
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8270	0.0000	
Ethylene Oxide	0.466	3.9020	9.2849	ppm
		5.7290	9.2849	

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:42:53
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



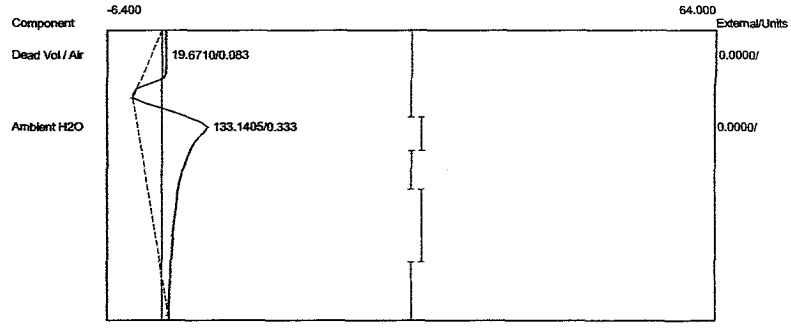
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	23.0990	0.0000	
Ambient H2O	0.333	130.0140	0.0000	
		153.1130	0.0000	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:44:36
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



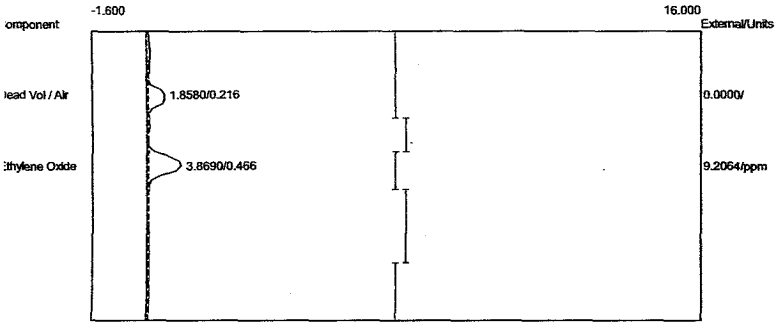
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8370	0.0000	
Ethylene Oxide	0.450	3.8625	9.1909	ppm
		5.6995	9.1909	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:44:36
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



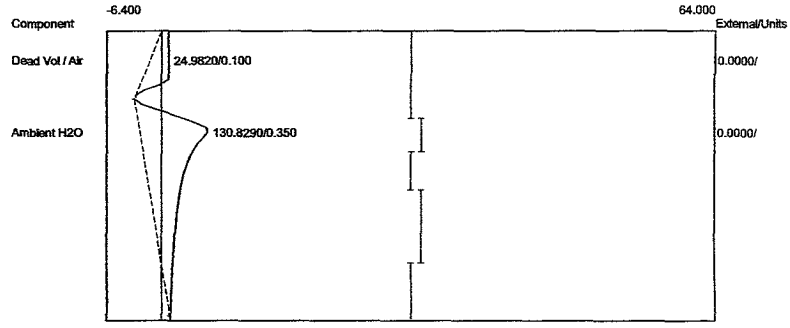
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	19.6710	0.0000	
Ambient H2O	0.333	133.1405	0.0000	
		152.8115	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:45:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2B12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8580	0.0000	
Ethylene Oxide	0.466	3.8690	9.2064	ppm
		5.7270	9.2064	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 10/24/2017 11:45:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2B12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer

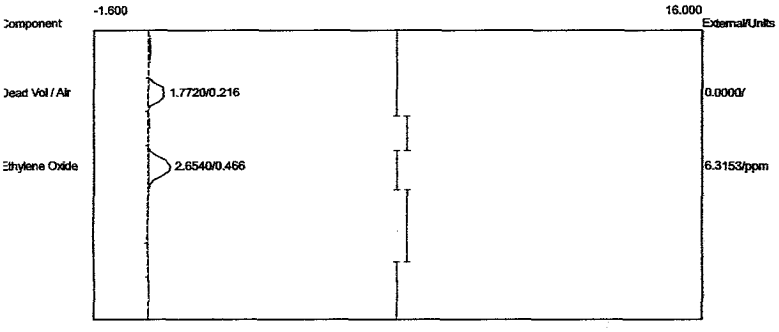


Component	Retention	Area	External	Units
Dead Vol / Air	0.100	24.9820	0.0000	
Ambient H2O	0.350	130.8290	0.0000	
		155.8110	0.0000	

APPENDIX E

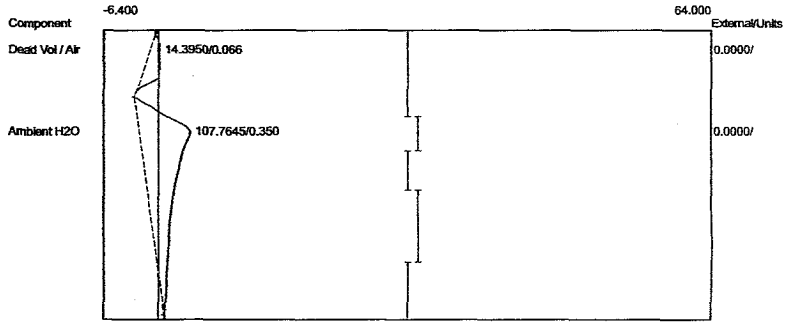
Run #2 Chromatograms – Aeration

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:27:58
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



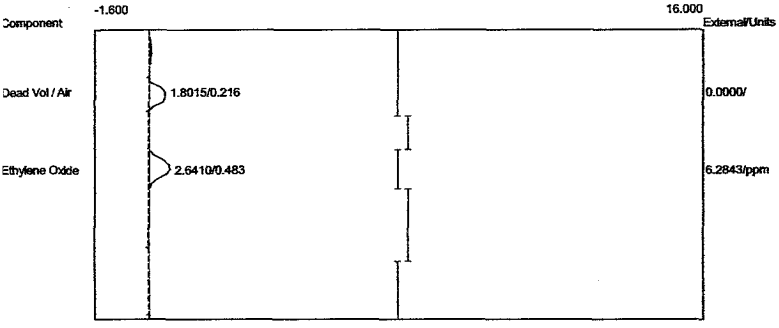
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7720	0.0000	
Ethylene Oxide	0.466	2.6540	6.3153	ppm
		4.4260	6.3153	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:27:58
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



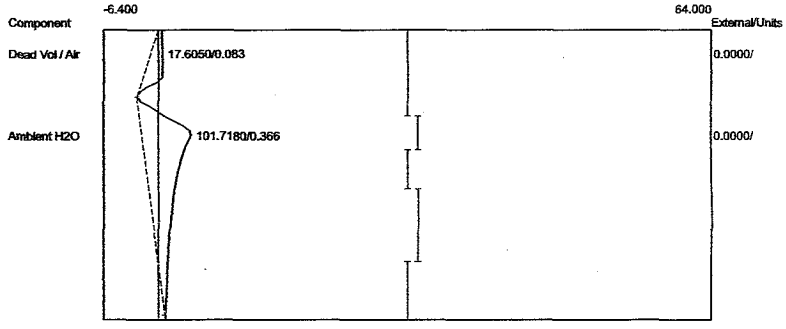
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	14.3950	0.0000	
Ambient H2O	0.350	107.7645	0.0000	
		122.1595	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:32:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



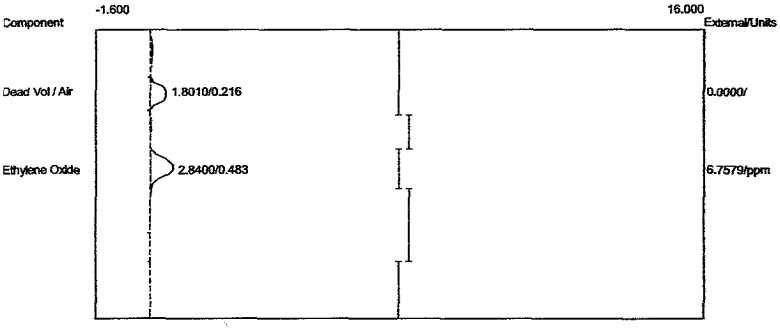
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8015	0.0000	
Ethylene Oxide	0.483	2.6410	6.2843	ppm
		4.4425	6.2843	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:32:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



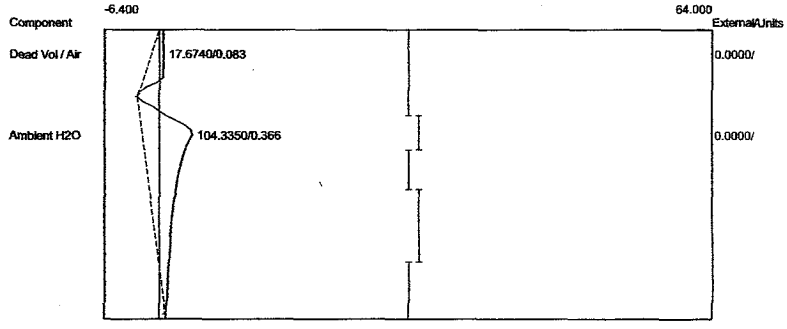
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	17.6050	0.0000	
Ambient H2O	0.366	101.7180	0.0000	
		119.3230	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:37:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



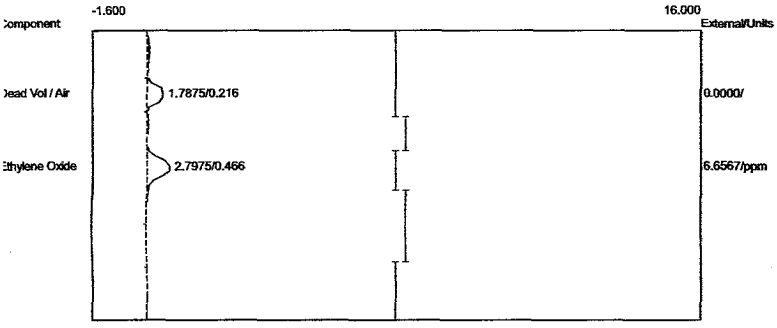
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8010	0.0000	
Ethylene Oxide	0.483	2.8400	6.7579	ppm
		4.6410	6.7579	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:37:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



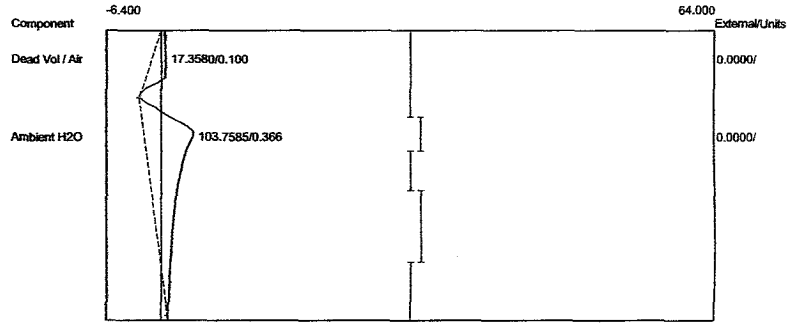
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	17.6740	0.0000	
Ambient H2O	0.366	104.3350	0.0000	
		122.0090	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:42:21
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



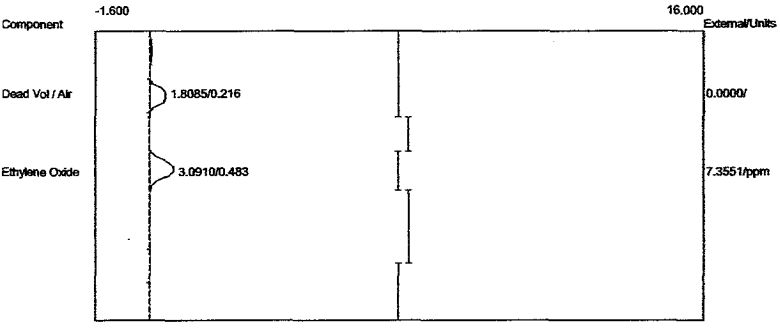
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7875	0.0000	
Ethylene Oxide	0.466	2.7975	6.6567	ppm
		4.5850	6.6567	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:42:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



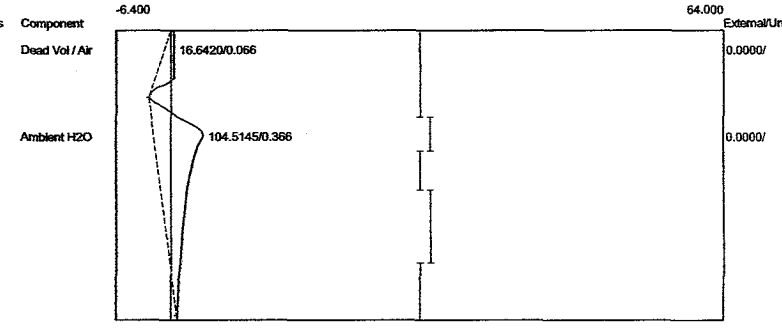
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	17.3580	0.0000	
Ambient H2O	0.366	103.7585	0.0000	
		121.1165	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:47:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



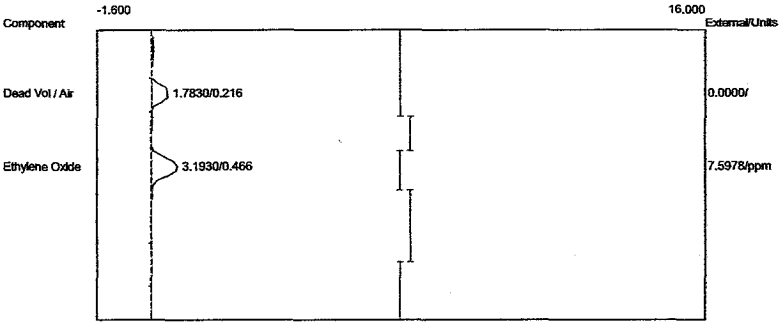
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8085	0.0000	
Ethylene Oxide	0.483	3.0910	7.3551	ppm
		4.8995	7.3551	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:47:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



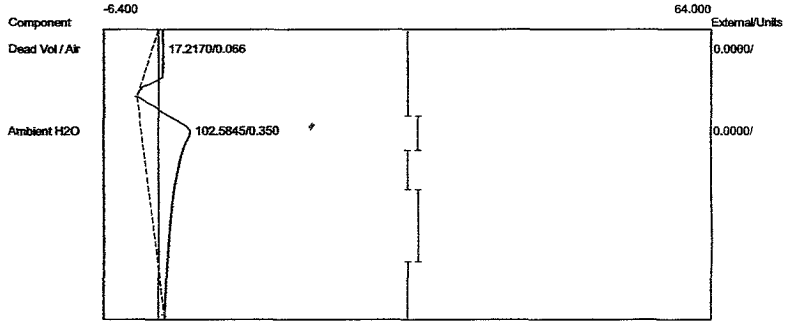
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	16.6420	0.0000	
Ambient H2O	0.366	104.5145	0.0000	
		121.1565	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:52:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



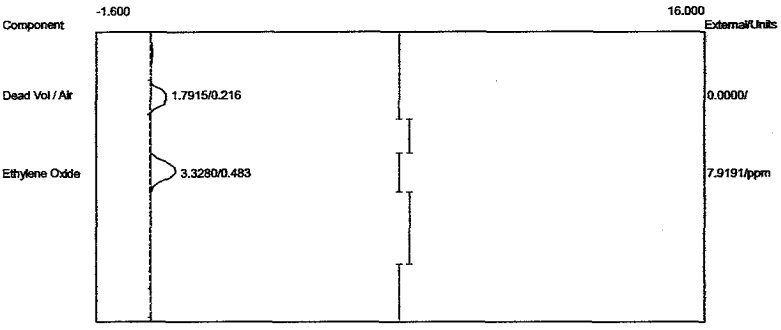
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7830	0.0000	
Ethylene Oxide	0.466	3.1930	7.5978	ppm
		4.9760	7.5978	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:52:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



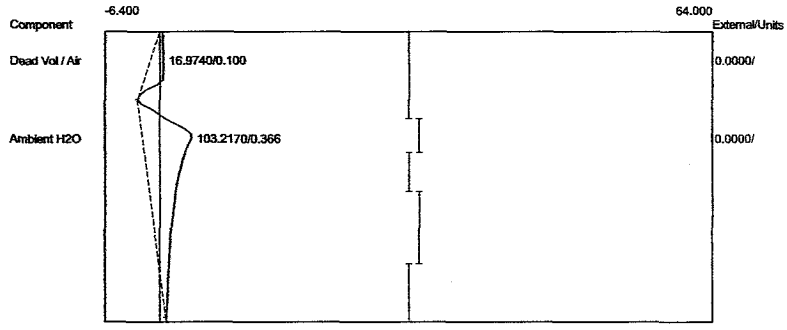
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	17.2170	0.0000	
Ambient H2O	0.350	102.5845	0.0000	
		119.8015	0.0000	

Lab name: ESSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:57:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



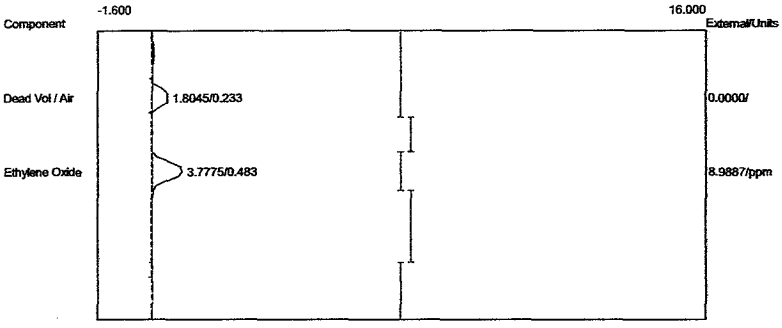
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7915	0.0000	
Ethylene Oxide	0.483	3.3280	7.9191	ppm
		5.1195	7.9191	

Lab name: ESSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 10:57:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



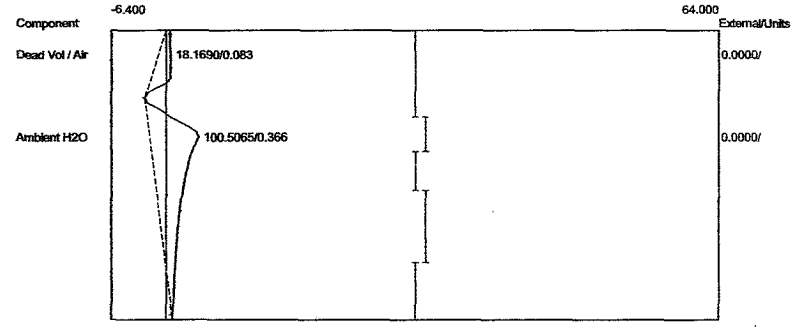
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	16.9740	0.0000	
Ambient H2O	0.366	103.2170	0.0000	
		120.1910	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:02:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



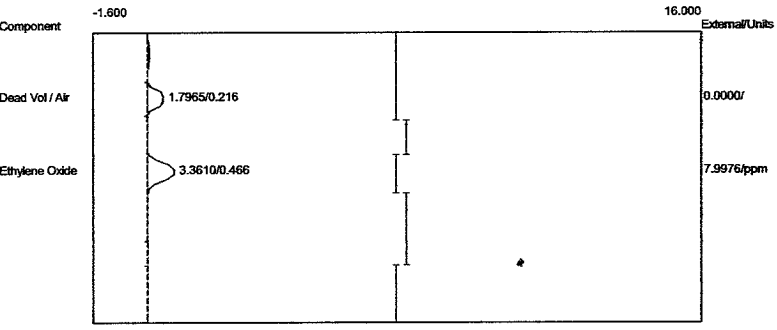
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8045	0.0000	
Ethylene Oxide	0.483	3.7775	8.9887	ppm
		5.5820	8.9887	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:02:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



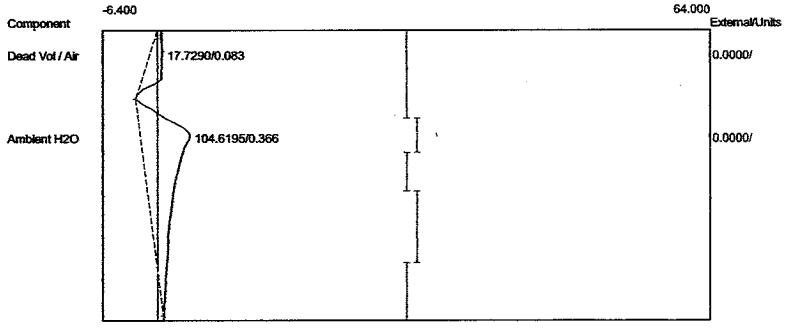
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	18.1690	0.0000	
Ambient H2O	0.366	100.5065	0.0000	
		118.6755	0.0000	

Lab name: ESSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:07:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



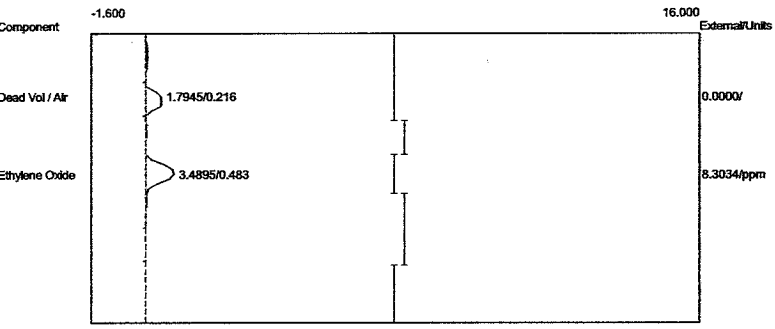
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7965	0.0000	
Ethylene Oxide	0.466	3.3610	7.9976	ppm
		5.1575	7.9976	

Lab name: ESSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:07:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



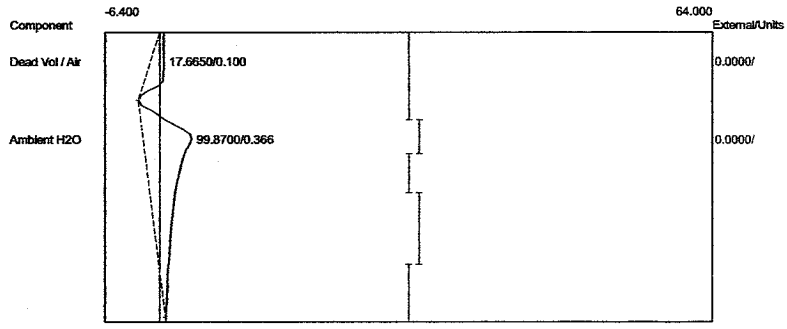
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	17.7290	0.0000	
Ambient H2O	0.366	104.6195	0.0000	
		122.3485	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:12:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



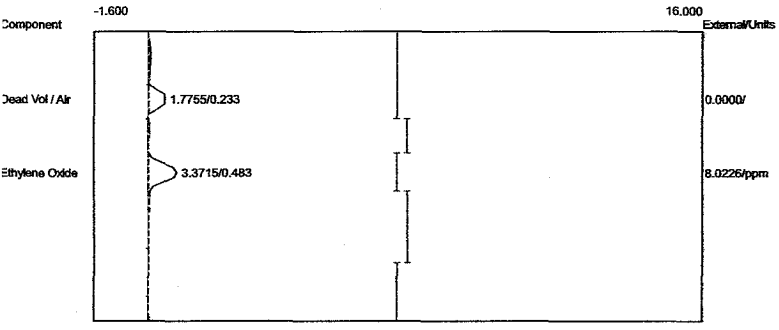
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7945	0.0000	
Ethylene Oxide	0.483	3.4895	8.3034	ppm
		5.2840	8.3034	

Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:12:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



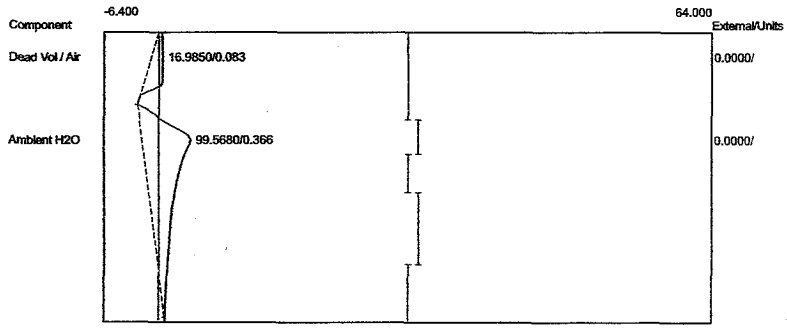
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	17.6650	0.0000	
Ambient H2O	0.366	99.8700	0.0000	
		117.5350	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:17:34
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



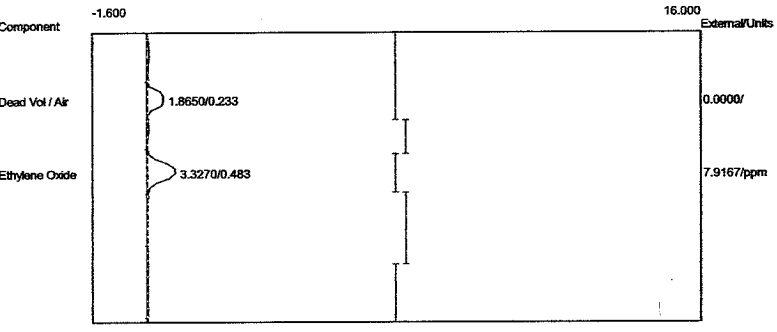
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7755	0.0000	
Ethylene Oxide	0.483	3.3715	8.0226	ppm
		5.1470	8.0226	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:17:34
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



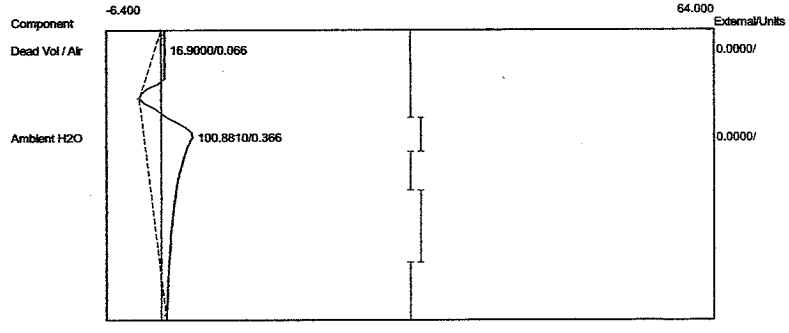
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	16.9850	0.0000	
Ambient H2O	0.366	99.5680	0.0000	
		116.5530	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:22:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-2A12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8650	0.0000	
Ethylene Oxide	0.483	3.3270	7.9167	ppm
		5.1920	7.9167	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 10/24/2017 11:22:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-2A12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



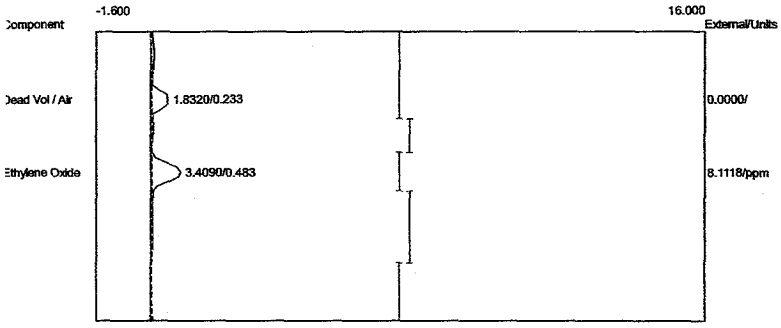
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	16.9000	0.0000	
Ambient H2O	0.366	100.8810	0.0000	
		117.7810	0.0000	

APPENDIX F

Run #3 Chromatograms – Backvent

Lab name: ESC

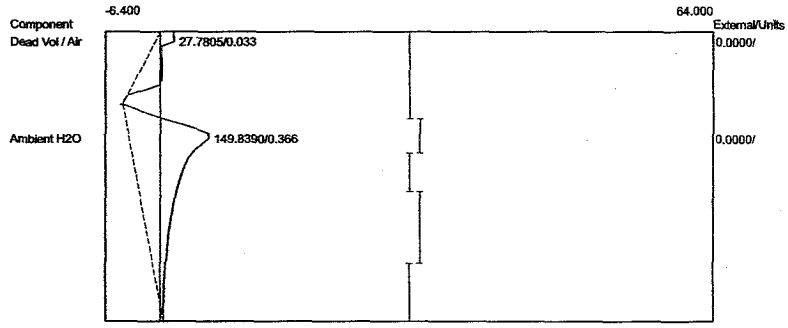
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:51:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8320	0.0000	
Ethylene Oxide	0.483	3.4090	8.1118	ppm
		5.2410	8.1118	

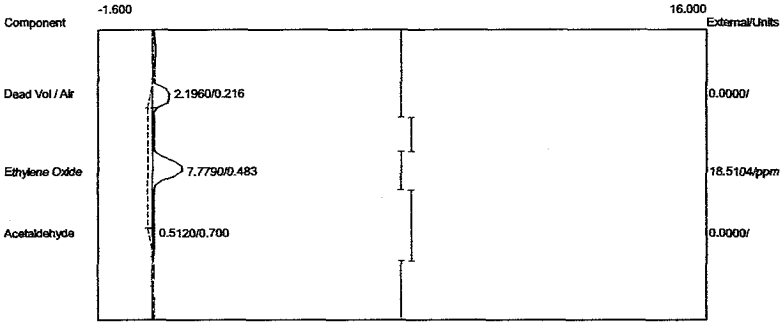
Lab name: ESC

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:51:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



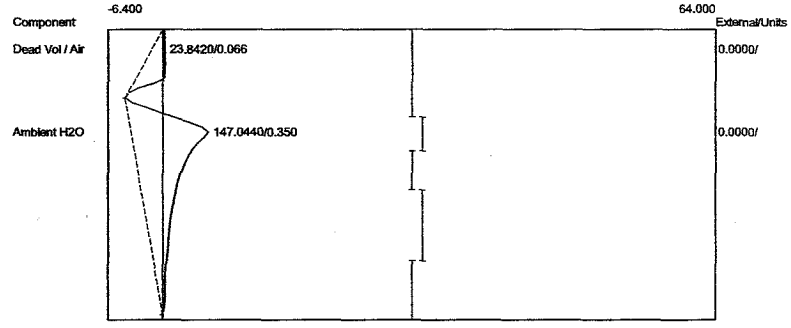
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	27.7805	0.0000	
Ambient H2O	0.366	149.8390	0.0000	
		177.6195	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:52:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



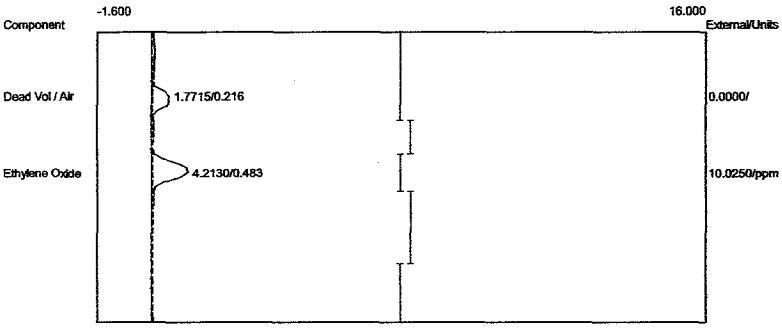
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	2.1960	0.0000	
Ethylene Oxide	0.483	7.7790	18.5104	ppm
Acetaldehyde	0.700	0.5120	0.0000	
		10.4870	18.5104	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:52:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



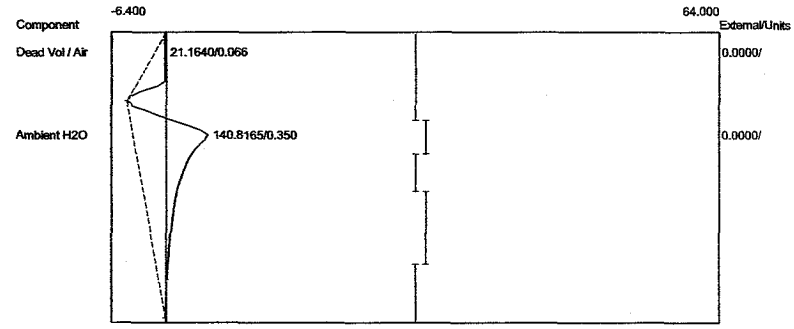
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	23.8420	0.0000	
Ambient H2O	0.350	147.0440	0.0000	
		170.8860	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:53:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



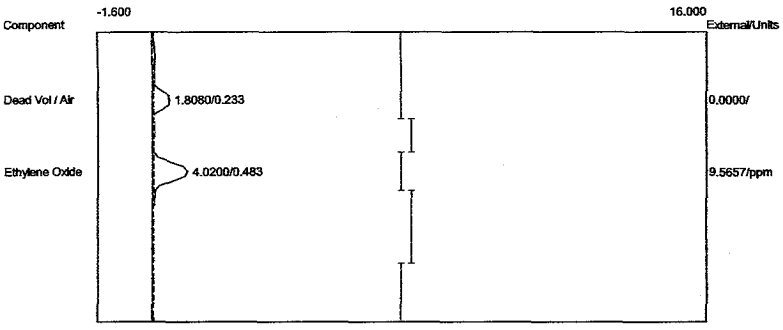
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7715	0.0000	
Ethylene Oxide	0.483	4.2130	10.0250	ppm
		5.9845	10.0250	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:53:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



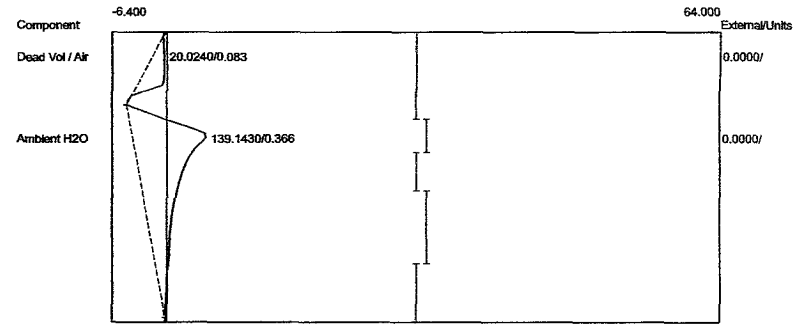
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	21.1640	0.0000	
Ambient H2O	0.350	140.8165	0.0000	
		161.9805	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:54:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



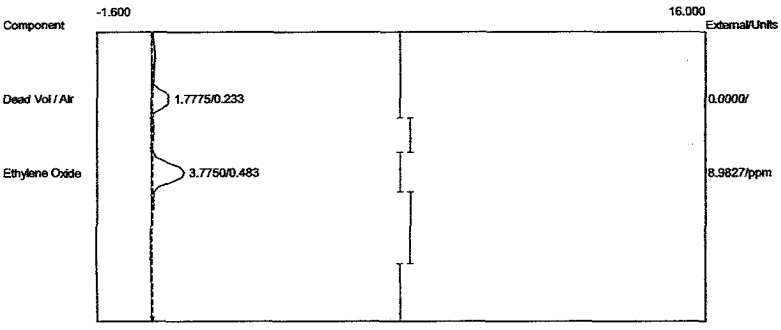
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8080	0.0000	
Ethylene Oxide	0.483	4.0200	9.5657	ppm
		5.8280	9.5657	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:54:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



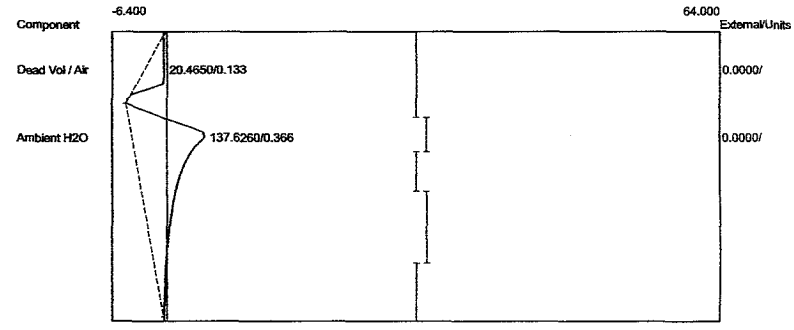
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	20.0240	0.0000	
Ambient H2O	0.366	139.1430	0.0000	
		159.1670	0.0000	

Lab name: ESSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:55:45
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



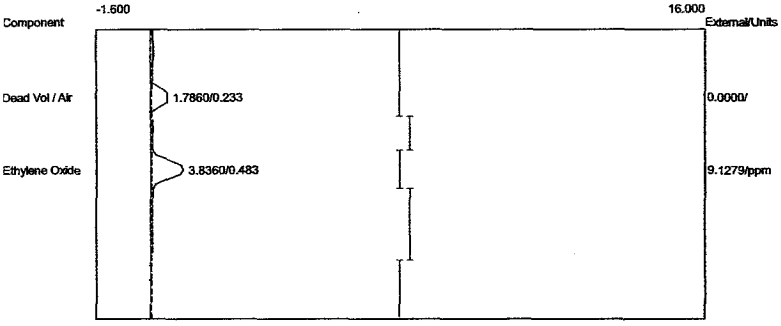
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7775	0.0000	
Ethylene Oxide	0.483	3.7750	8.9827	ppm
		5.5525	8.9827	

Lab name: ESSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:55:45
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



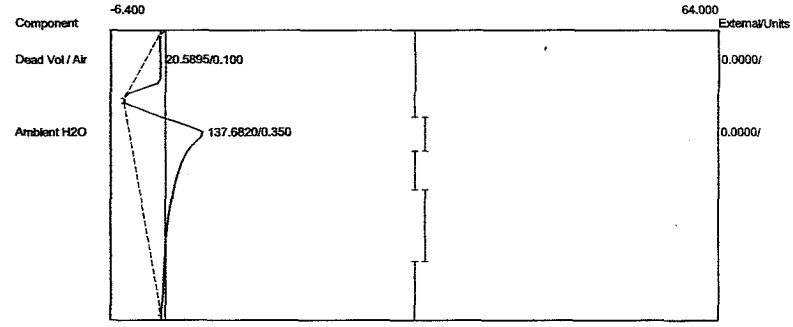
Component	Retention	Area	External	Units
Dead Vol / Air	0.133	20.4650	0.0000	
Ambient H2O	0.366	137.6260	0.0000	
		158.0910	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:56:55
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



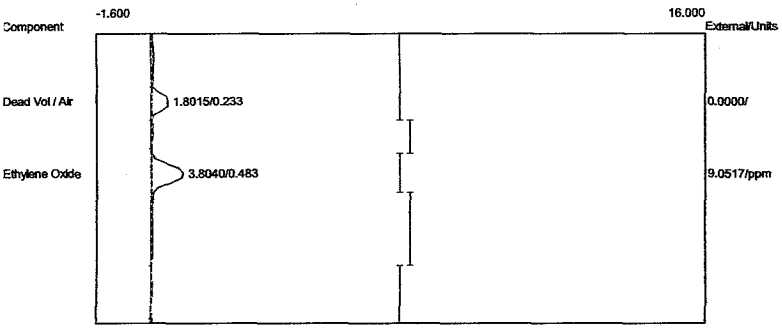
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7860	0.0000	
Ethylene Oxide	0.483	3.8360	9.1279	ppm
		5.6220	9.1279	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:56:55
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



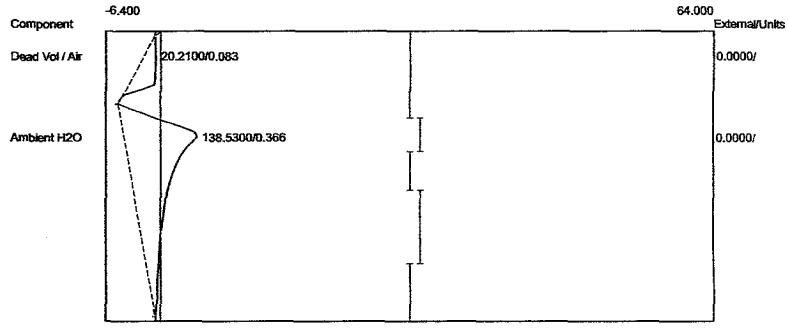
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	20.5895	0.0000	
Ambient H2O	0.350	137.6820	0.0000	
		158.2715	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:58:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



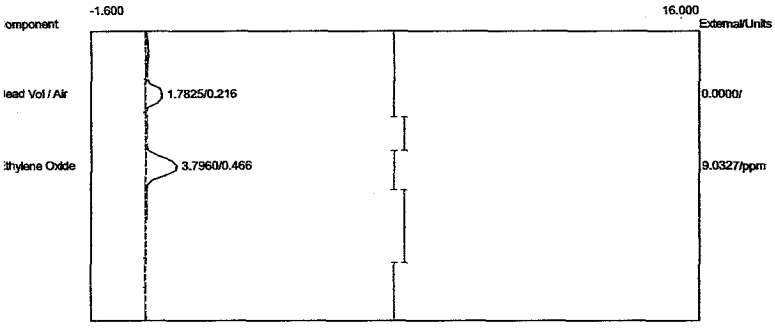
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8015	0.0000	
Ethylene Oxide	0.483	3.8040	9.0517	ppm
		5.6055	9.0517	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:58:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



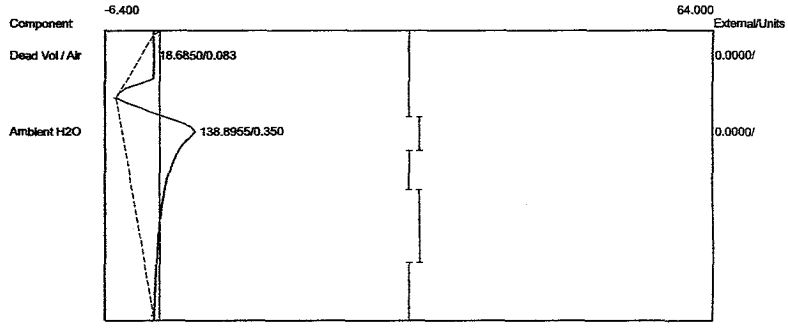
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	20.2100	0.0000	
Ambient H2O	0.366	138.5300	0.0000	
		158.7400	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:59:10
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



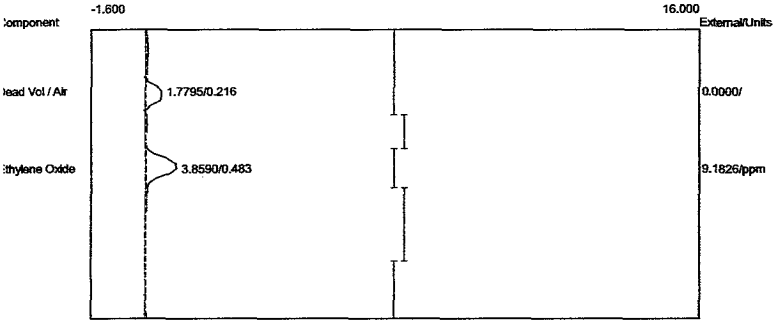
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7825	0.0000	
Ethylene Oxide	0.466	3.7960	9.0327	ppm
		5.5785	9.0327	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 12:59:10
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



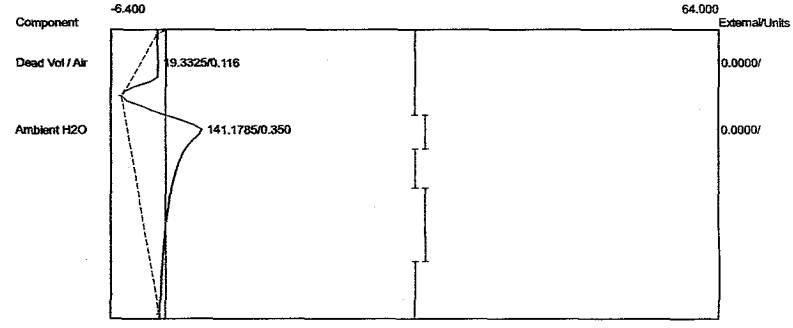
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	18.6850	0.0000	
Ambient H2O	0.350	138.8955	0.0000	
		157.5805	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 13:00:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



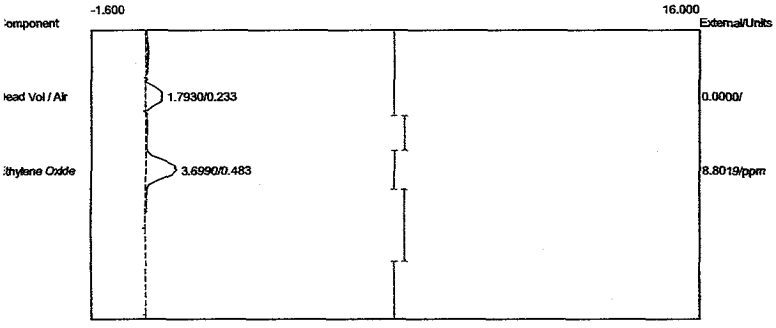
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7795	0.0000	
Ethylene Oxide	0.483	3.8590	9.1826	ppm
		5.6385	9.1826	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 13:00:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



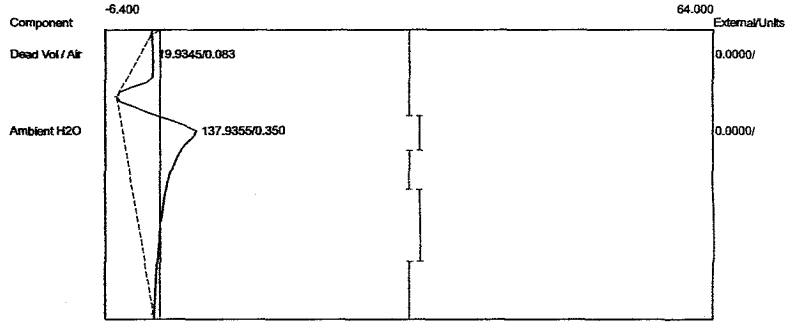
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	19.3325	0.0000	
Ambient H2O	0.350	141.1785	0.0000	
		160.5110	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 13:02:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



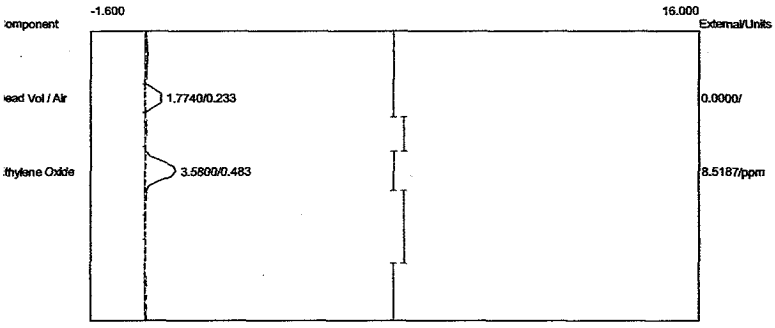
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7930	0.0000	
Ethylene Oxide	0.483	3.6990	8.8019	ppm
		5.4920	8.8019	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 13:02:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



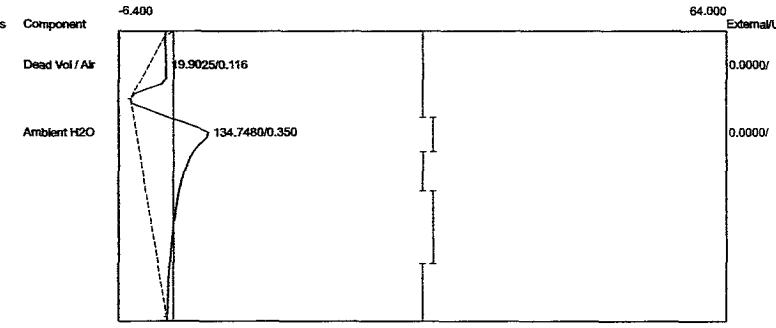
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	19.9345	0.0000	
Ambient H2O	0.350	137.9355	0.0000	
		157.8700	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 13:03:36
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



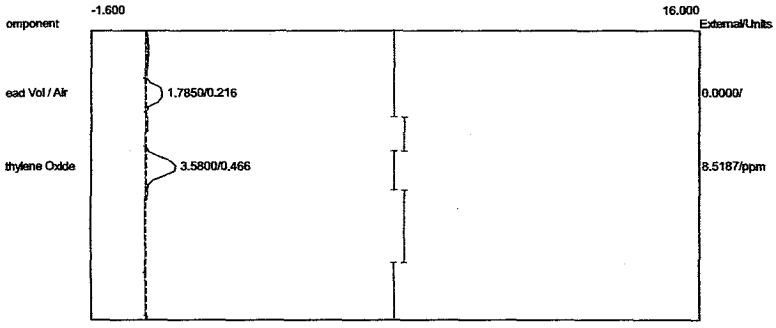
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.7740	0.0000	
Ethylene Oxide	0.483	3.5800	8.5187	ppm
		5.3540	8.5187	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 13:03:36
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



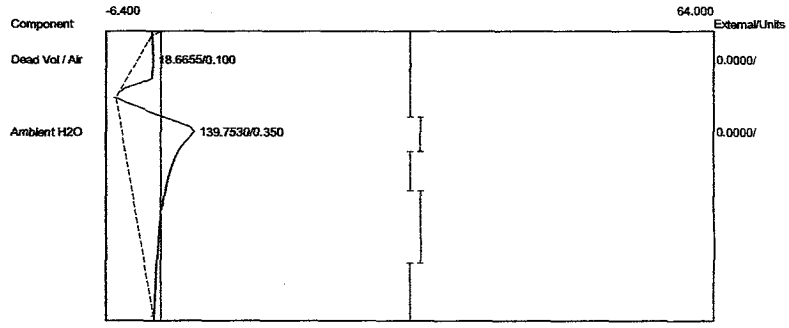
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	19.9025	0.0000	
Ambient H2O	0.350	134.7480	0.0000	
		154.6505	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 13:04:50
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3B12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7850	0.0000	
Ethylene Oxide	0.466	3.5800	8.5187	ppm
		5.3650	8.5187	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 10/24/2017 13:04:50
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3B12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



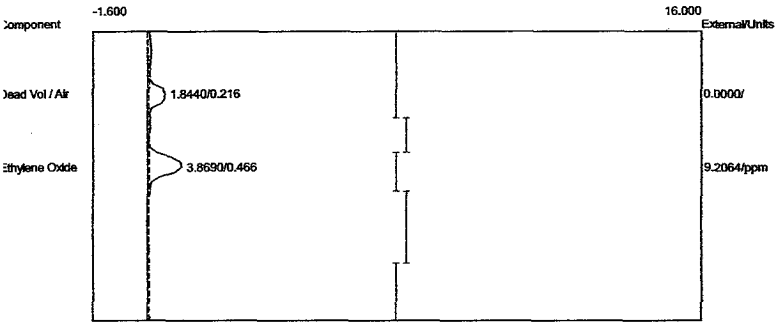
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	18.6655	0.0000	
Ambient H2O	0.350	139.7530	0.0000	
		158.4185	0.0000	

APPENDIX G

Run #3 Chromatograms – Aeration

Lab name: ESC

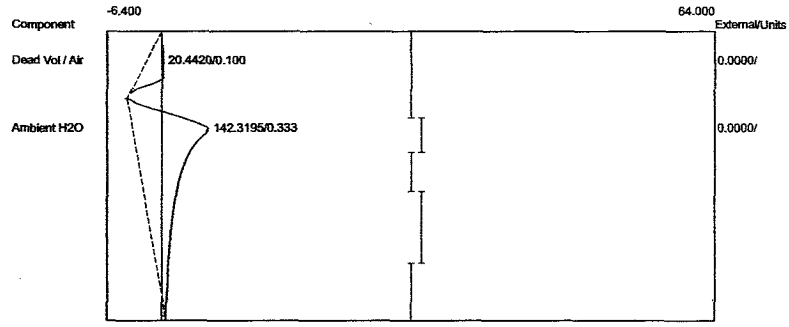
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 11:49:24
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8440	0.0000	
Ethylene Oxide	0.466	3.8690	9.2064	ppm
		5.7130	9.2064	

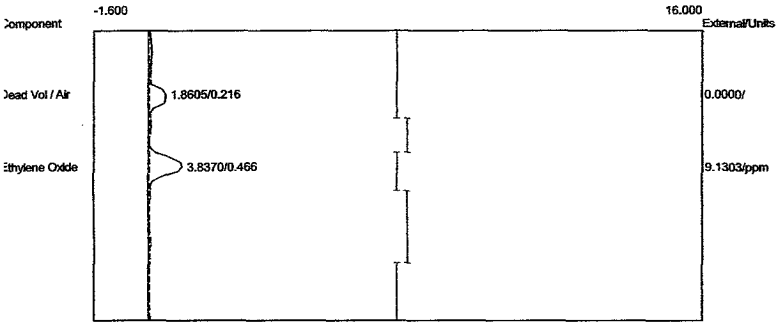
Lab name: ESC

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 11:49:24
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



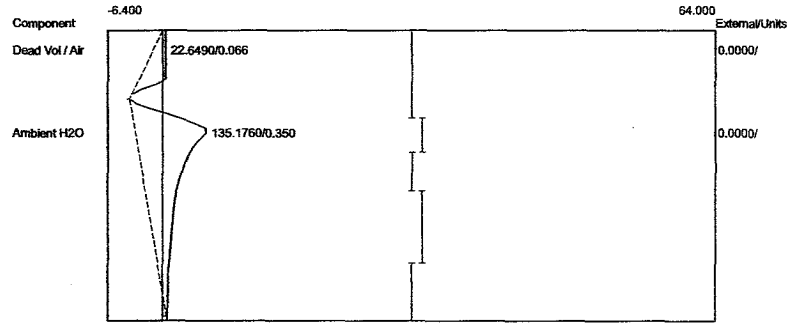
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	20.4420	0.0000	
Ambient H2O	0.333	142.3195	0.0000	
		162.7615	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 11:54:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



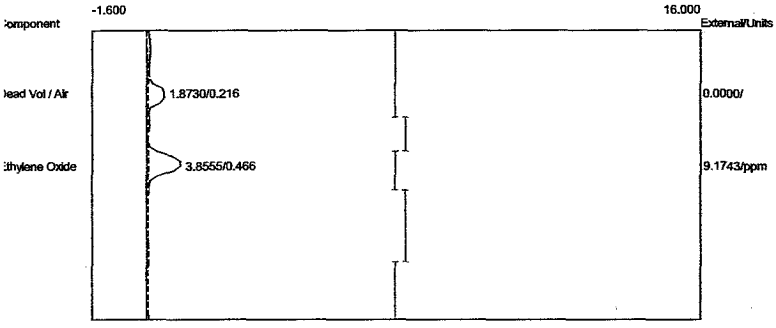
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8605	0.0000	
Ethylene Oxide	0.466	3.8370	9.1303	ppm
		5.6975	9.1303	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 11:54:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



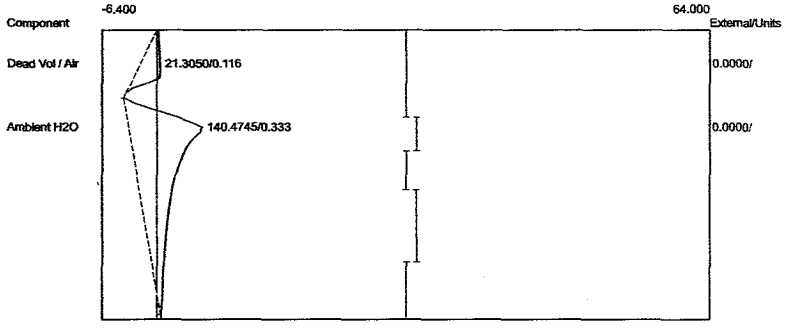
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	22.6490	0.0000	
Ambient H2O	0.350	135.1760	0.0000	
		157.8250	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 11:59:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



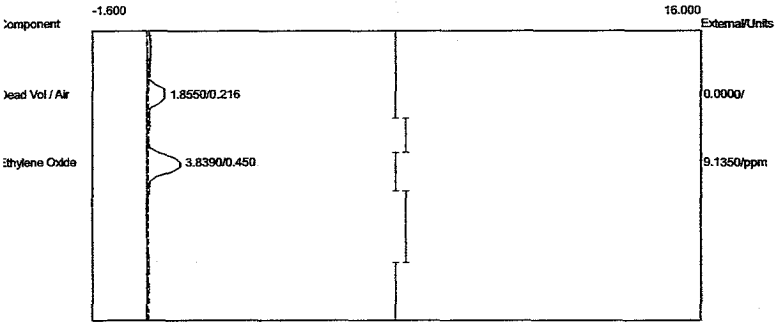
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8730	0.0000	
Ethylene Oxide	0.466	3.8555	9.1743	ppm
		5.7285	9.1743	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 11:59:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



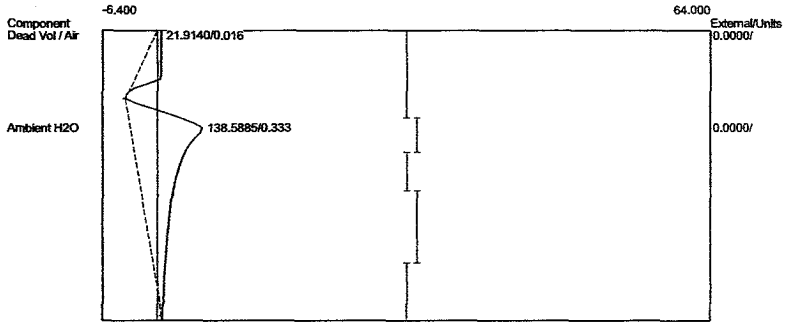
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	21.3050	0.0000	
Ambient H2O	0.333	140.4745	0.0000	
		161.7795	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:04:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



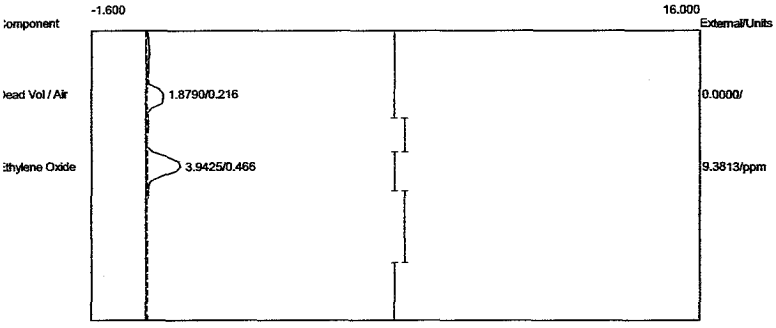
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8550	0.0000	
Ethylene Oxide	0.450	3.8390	9.1350	ppm
		5.6940	9.1350	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:04:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



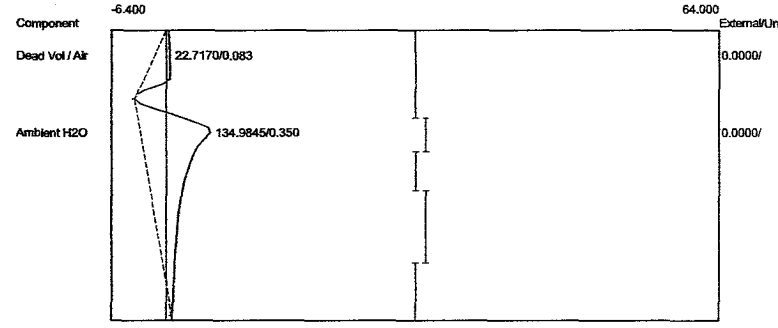
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	21.9140	0.0000	
Ambient H2O	0.333	138.5885	0.0000	
		160.5025	0.0000	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:09:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



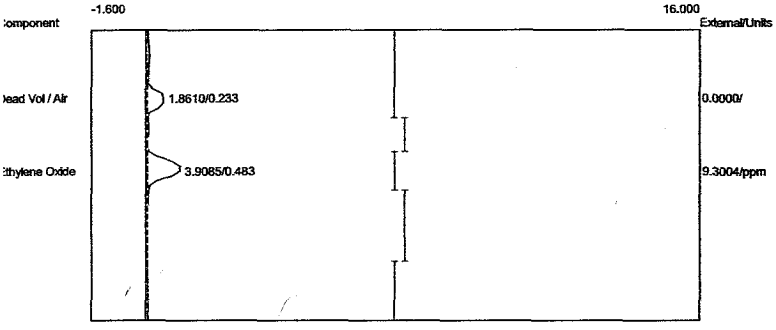
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8790	0.0000	
Ethylene Oxide	0.466	3.9425	9.3813	ppm
		5.8215	9.3813	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:09:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



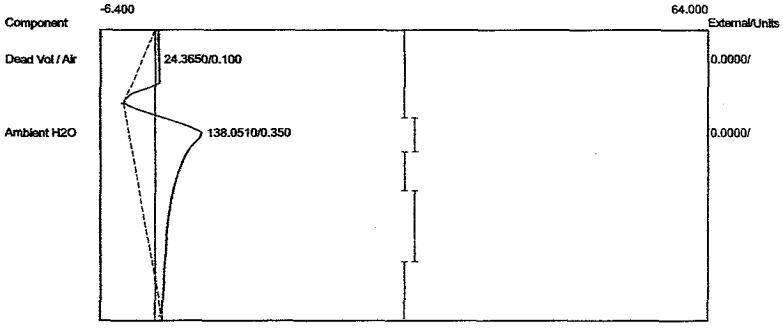
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	22.7170	0.0000	
Ambient H2O	0.350	134.9845	0.0000	
		157.7015	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:14:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



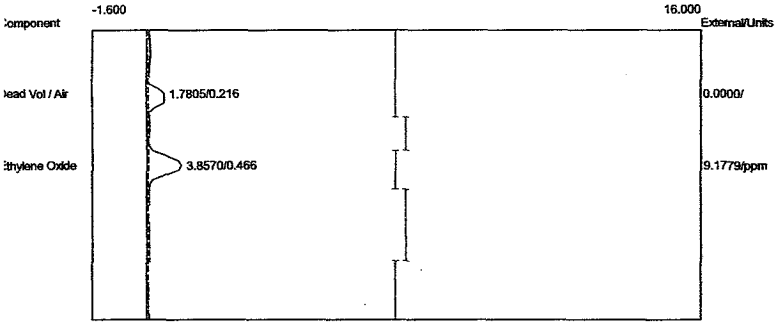
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8610	0.0000	
Ethylene Oxide	0.483	3.9085	9.3004	ppm
		5.7695	9.3004	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:14:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



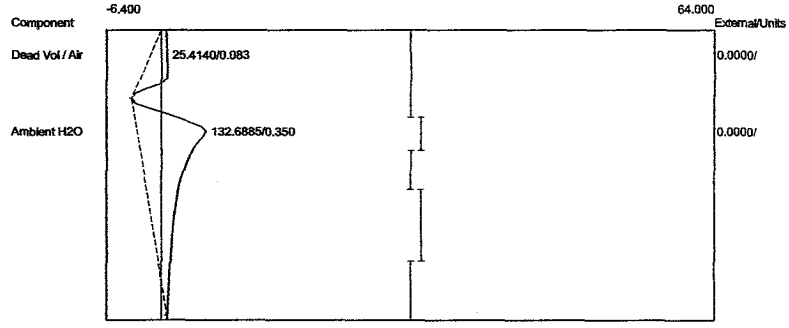
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	24.3650	0.0000	
Ambient H2O	0.350	138.0510	0.0000	
		162.4160	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:19:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.7805	0.0000	
Ethylene Oxide	0.466	3.8570	9.1779	ppm
		5.6375	9.1779	

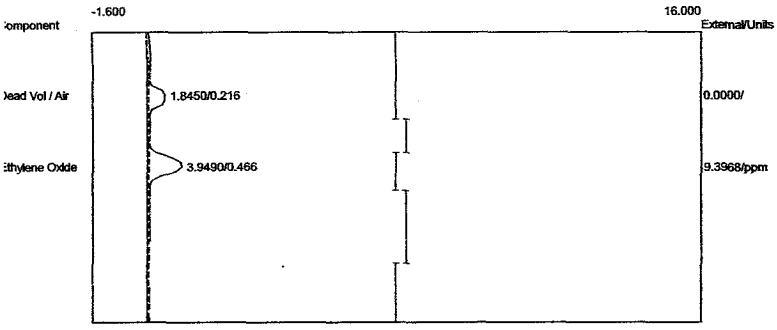
Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:19:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	25.4140	0.0000	
Ambient H2O	0.350	132.6885	0.0000	
		158.1025	0.0000	

Lab name: ESC

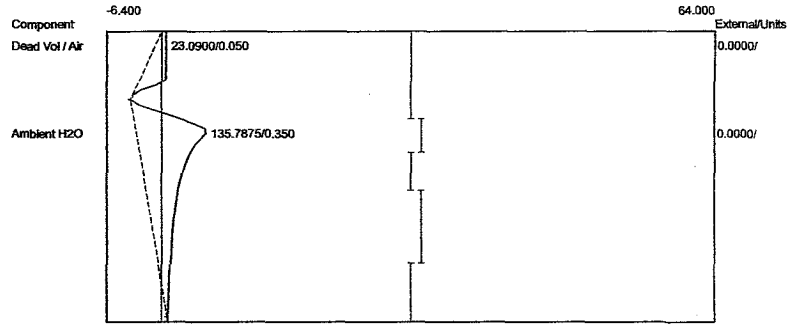
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:24:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8450	0.0000	
Ethylene Oxide	0.466	3.9490	9.3968	ppm
		5.7940	9.3968	

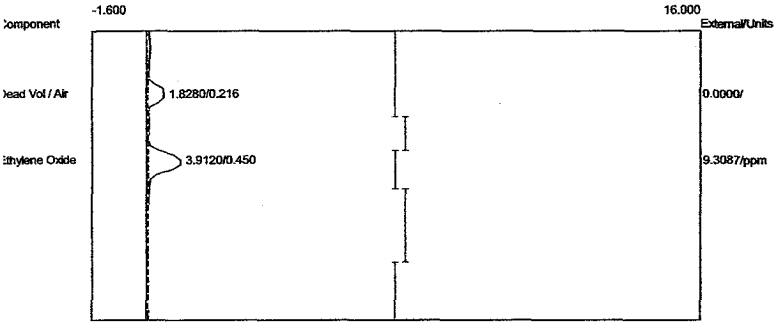
Lab name: ESC

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:24:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



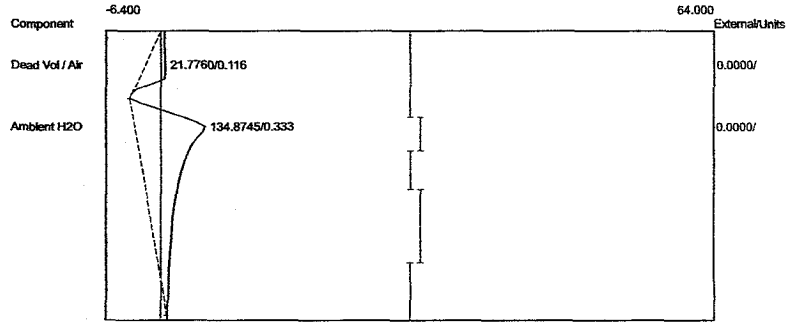
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	23.0900	0.0000	
Ambient H2O	0.350	135.7875	0.0000	
		158.8775	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:29:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



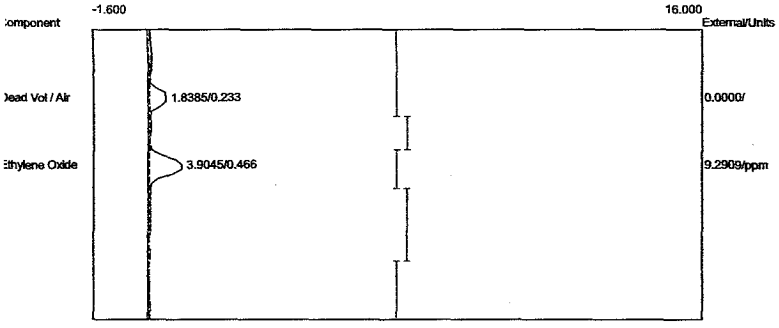
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8280	0.0000	
Ethylene Oxide	0.450	3.9120	9.3087	ppm
		5.7400	9.3087	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:29:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



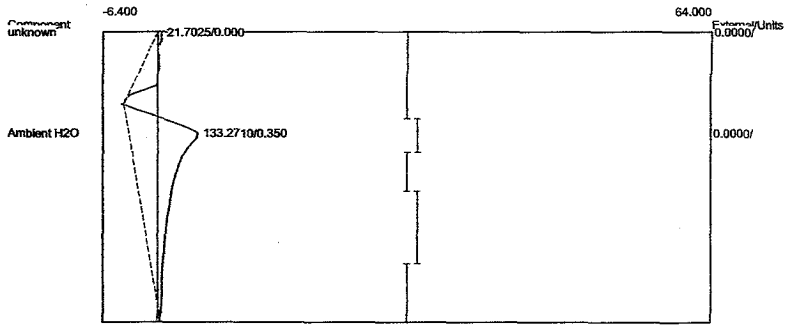
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	21.7760	0.0000	
Ambient H2O	0.333	134.8745	0.0000	
		156.6505	0.0000	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:34:25
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



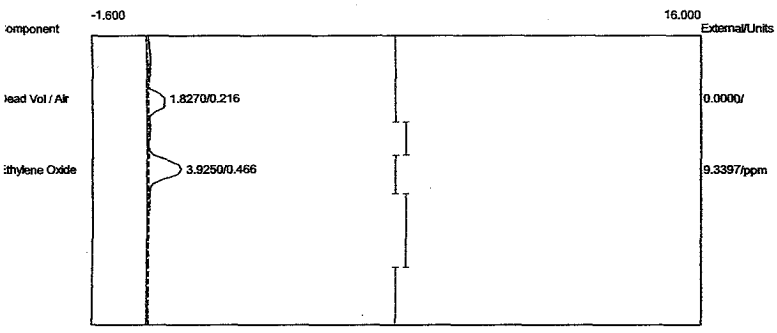
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	1.8385	0.0000	
Ethylene Oxide	0.466	3.9045	9.2909	ppm
		5.7430	9.2909	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:34:25
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



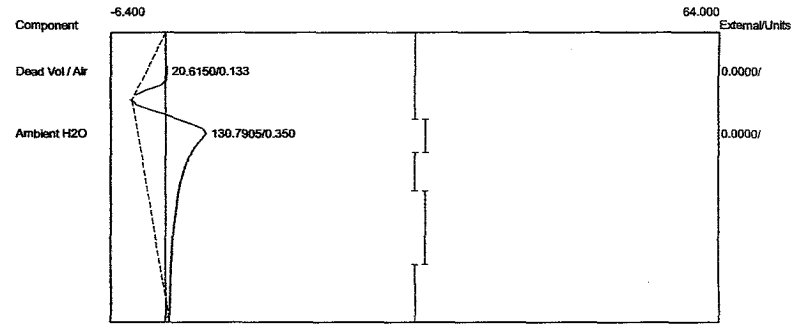
Component	Retention	Area	External	Units
Ambient H2O	0.350	133.2710	0.0000	
		133.2710	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:39:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



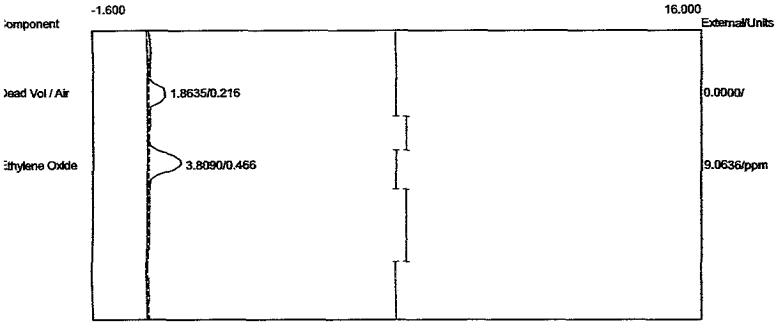
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8270	0.0000	
Ethylene Oxide	0.466	3.9250	9.3397	ppm
		5.7520	9.3397	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:39:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



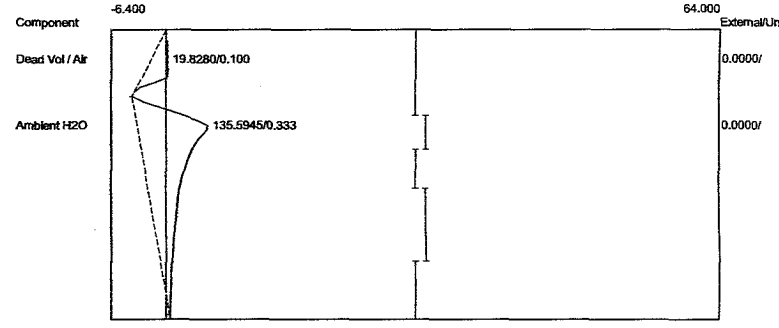
Component	Retention	Area	External	Units
Dead Vol / Air	0.133	20.6150	0.0000	
Ambient H2O	0.350	130.7905	0.0000	
		151.4055	0.0000	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:44:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQ2017-3A12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	1.8635	0.0000	
Ethylene Oxide	0.466	3.8090	9.0636	ppm
		5.6725	9.0636	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 10/24/2017 12:44:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQ2017-3A12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.100	19.8280	0.0000	
Ambient H2O	0.333	135.5945	0.0000	
		155.4225	0.0000	

APPENDIX H

Field Data and Calculation Worksheets

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics U.S., LLC. - Queensbury, New York
10/24/17 - Backvent Runs 1-3

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
	Run #1		
0.29	0.5385	200	0.01
0.29	0.5385	200	0.01
0.29	0.5385	200	0.01
0.29	0.5385	200	0.01
0.29	0.5385	200	0.01
0.29	0.5385	200	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
	Run #2		
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	203	0.01
	Run #3		
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
Average =			
0.29	0.5385	201.3	**0.0100**
	=	661	degR

mw =	28.51	
stack area =	3.14	
press =	29.75	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	40.2	ft/sec
Flow =	**5839**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.000007**	**lbs/min**
EtO Mass Flow =	**0.000400**	**lbs/hr**

ECSi, Inc.

Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics U.S., LLC. - Queensbury, New York
10/24/17 - Aeration Runs 1-3

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
	Run #1		
0.29	0.5385	200	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
0.29	0.5385	202	0.01
	Run #2		
0.29	0.5385	202	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
0.29	0.5385	201	0.01
	Run #3		
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
0.29	0.5385	203	0.01
Average =			
0.29	0.5385	201.8	**0.0100**
	=	662	degR

mw =	28.51	
stack area =	3.14	
press =	29.75	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	40.3	ft/sec
Flow =	**5837**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.000007**	**lbs/min**
EtO Mass Flow =	**0.000400**	**lbs/hr**

ETHYLENE OXIDE SOURCE TEST/CALIBRATION DATA

Client: Sterigenics-Queensbury, NY

Source Tested: Ceilcote Packed Tower Scrubber and Donaldson EtO Abator   Date: 10/23-10/24/17

PRE CALIBRATION

Inlet (FID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
	Area Counts #1	.459	4.25	43.2					
	Area Counts #2	.442	4.33	42.0					
	Average Area	.451	4.29	42.6					
	Audit Standard (48.8 ppmv) Result					49.9 ✓			
Outlet (PID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
	Area Counts #1	2.65	23.3	221					
	Area Counts #2	2.59	24.2	221					
	Average Area	2.62	23.8	221					
	Audit Standard (48.8 ppmv) Result					48.3 ✓			

	Run #1 (Ch. 9)	Run #2 (Ch.3)	Run #3 (Ch.1)
Exh start/stop:	~~1325~~ 1916 / ~~1402~~ 1953	2023/2031	2104/2112
BV start/stop:	1009/1024	1131/1146	1250/1315
Aer start/stop:	0845/0945	1025/1125	1147/1247

P_{bar}: 29.75   EtO Usage (lbs/yr): —

$\%H_2O$: 3   Cycles Per Week: —

POST CALIBRATION

Inlet (FID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
	Area Counts #1								
	Area Counts #2								
	Average Area					Mid	Post		
	Audit Standard (48.8 ppmv) Result					49.1 ✓	49.2 ✓		
Outlet (PID)	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
	Area Counts #1								
	Area Counts #2								
	Average Area					Mid	Post		
	Audit Standard (48.8 ppmv) Result					49.3 ✓	49.8 ✓		

ECSi

APPENDIX I

Gas Certifications

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

600 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-001
Item No.: 0202000131OTCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CAL4448
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1.10	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)	Certified Concentration (Moles)	Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1. PPM	1.10 PPM	10.0	5.00
NITROGEN	BAL	BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-003
Item No.: 02020001320TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM003232
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10.1	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: MT MT DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)	Certified Concentration (Moles)	Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10. PPM	10.1 PPM	1.0	5.00
NITROGEN	BAL	BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases
500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-004
Item No.: 02020001330TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM011385
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	100.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	100.	PPM	100.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1400 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-005
Item No.: 020200013 40TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCall BLM DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1,000.	PPM	1,000.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1300 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

00 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 18Apr2016

Customer

ECSI, INC
PO BOX 848
SAN CLEMENTE, CA 92672

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10,080.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM DATE: 4-18-16

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10,000.	PPM	10,080.	PPM	.8	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 800 PSIG
Expiration Date: 18Apr2018

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFICATE OF ANALYSIS

Customer Name:	ECSi, Inc.	**Cylinder Number:**	SA25925
Stock or Analyzer Tag Number:	N/A	**Product Class:**	Certified Standard
Customer Reference:	Verbal- Dan	**Cylinder - Contents[1]:**	28 CF @ 2000 PSI
MESA Reference:	104448	**Cylinder-CGA:**	A006-HP-BR/350
Date of Certification:	4/20/2016	**Analysis Method:**	GC-TCD/FID
Recommended Shelf Life:	2 Years	**Preparation Method:**	Gravimetric

Component	Requested Concentration[2]	Reported Concentration[2,3]
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature:

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

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